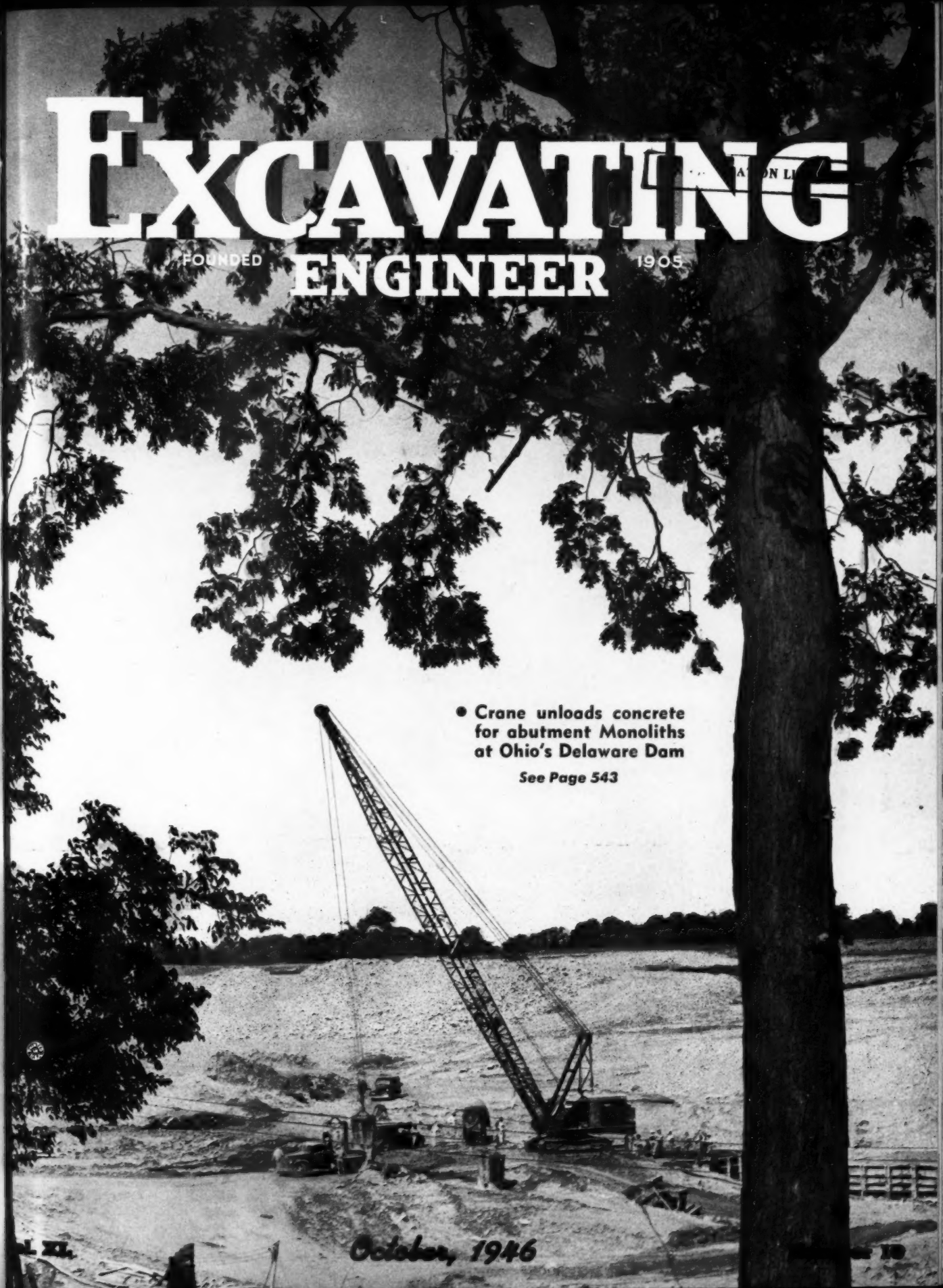
EXCAVATING ENGINEER

FOUNDED 1905



• Crane unloads concrete for abutment Monoliths at Ohio's Delaware Dam

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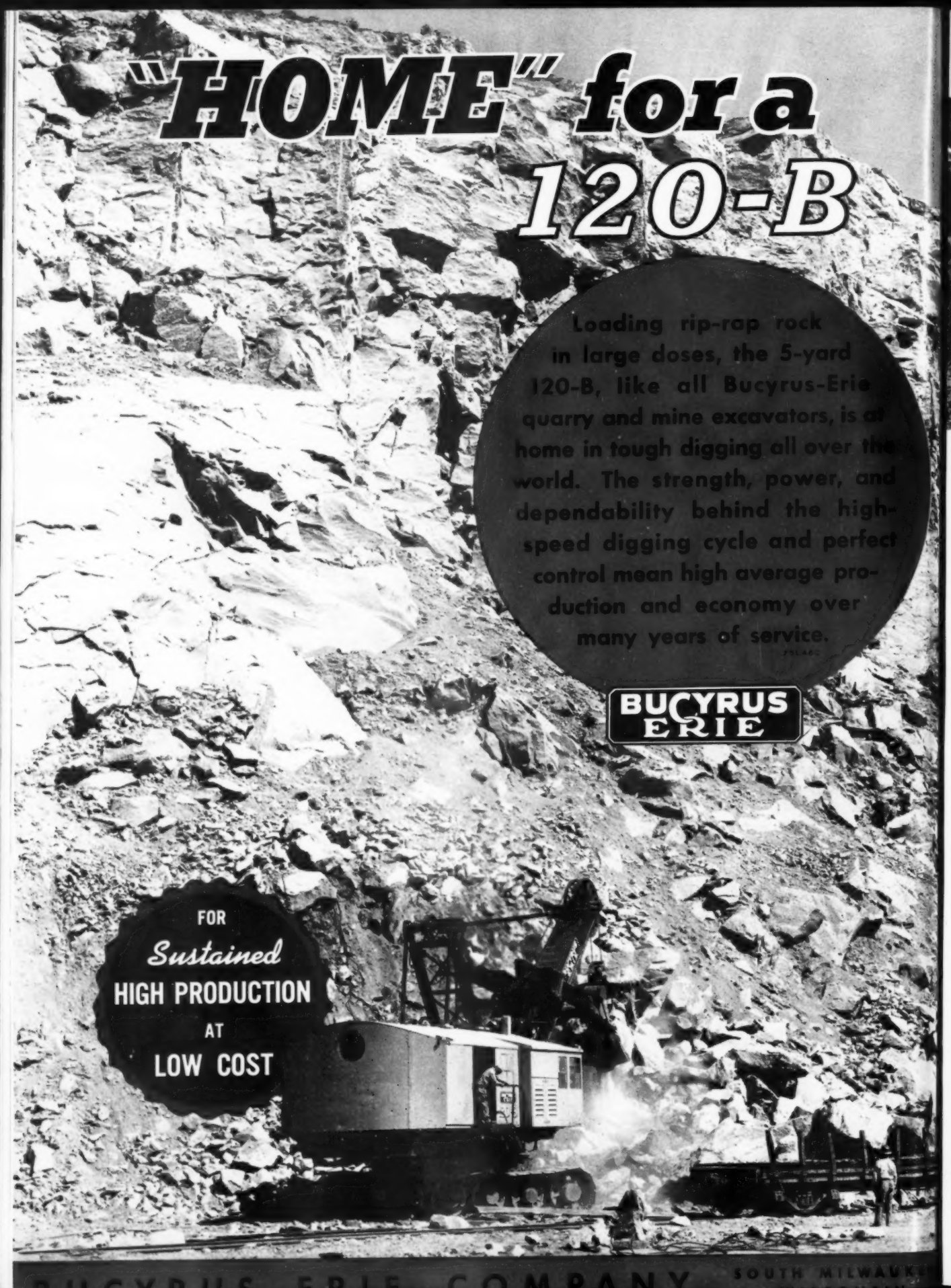
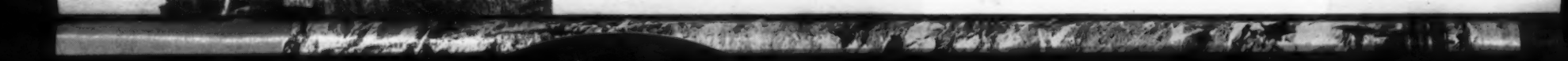

"HOME" for a 120-B
Loading rip-rap rock in large doses, the 5-yard 120-B, like all Bucyrus-Erie quarry and mine excavators, is at home in tough digging all over the world. The strength, power, and dependability behind the high-speed digging cycle and perfect control mean high average production and economy over many years of service.
BUCYRUS ERIE
FOR Sustained HIGH PRODUCTION AT LOW COST
BUCYRUS ERIE COMPANY
SOUTH MILWAUKEE



ALL-STAR EARTHMOVING TEAM

On a big levee-enlarging contract near Turrell, Arkansas, Stacy McAdams is moving a lot of yardage in a hurry with an all-star "Caterpillar" Zoned Equipment set-up.

The equipment he uses includes one of the early types built by "Caterpillar"—a No. 48 Elevating Grader—and some of the newest—five "Caterpillar" Diesel DW10 Tractors with W10 Wagons. In addition, he has a "Caterpillar" Diesel D8 to pull the Elevating Grader; a D7 and a D6, equipped with bulldozers; and a No. 11 Motor Grader for finishing.

Those fast-stepping "Caterpillar" Diesel DW10s can make up to 18 miles per hour on long hauls to the fill. Their 5-speed transmission hauls the load surely up steep grades, and finger-tip hydraulic steering makes it easy to put the earth exactly where it's wanted.

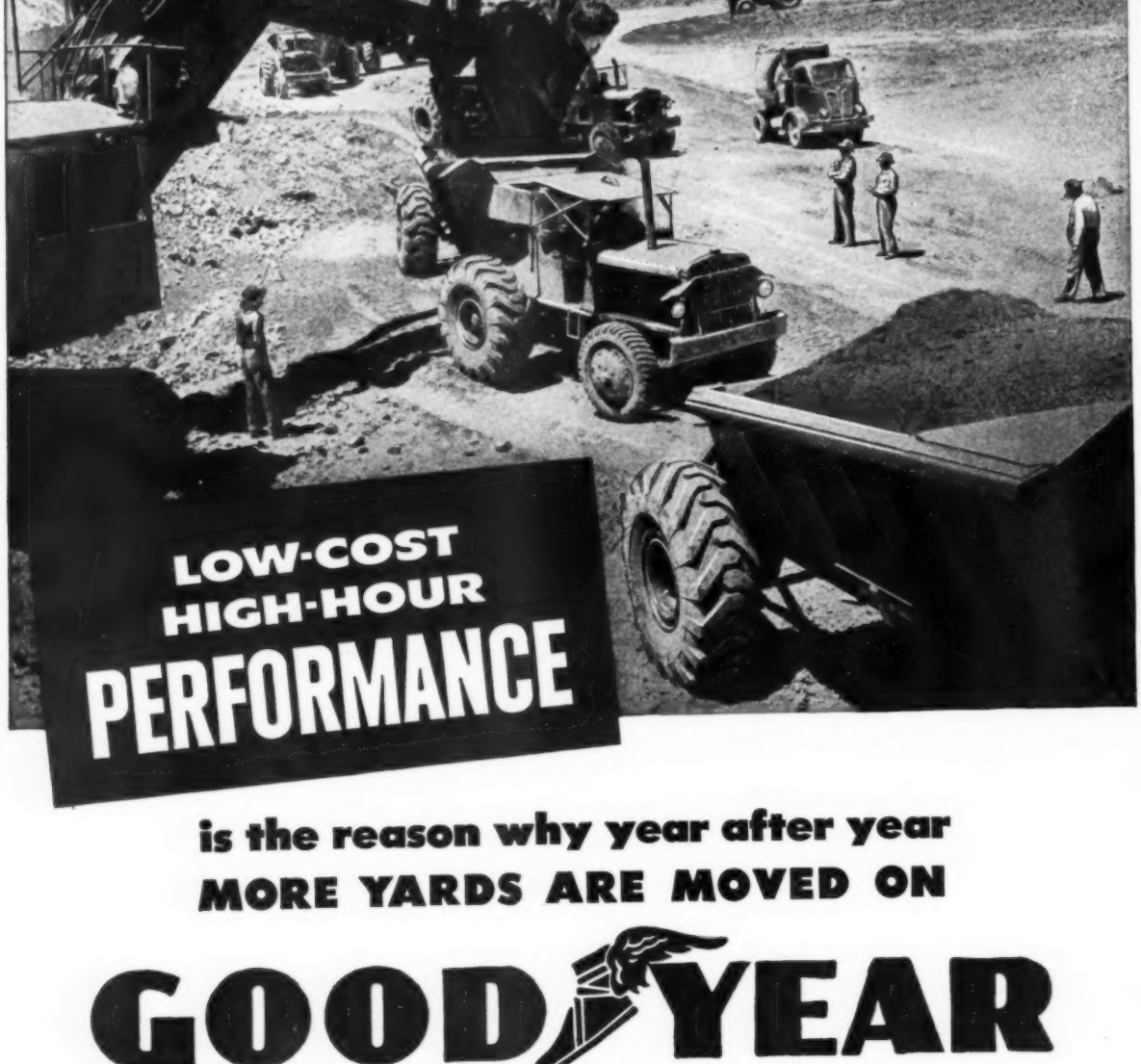
Built to handle the toughest jobs in their field, and backed by sure, efficient dealer service, "Caterpillar" Diesel Earthmoving Equipment has no equal for *"lowest costs on earth."*

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



LOW-COST HIGH-HOUR PERFORMANCE

is the reason why year after year
MORE YARDS ARE MOVED ON

GOODYEAR

OFF-THE-ROAD TIRES
THAN ON ANY OTHER KIND!

BUY and SPECIFY
GOODYEAR
— it pays!

SURE-GRIP EARTH MOVER for maximum traction on drive wheels

ALL-WEATHER EARTH MOVER for drawn vehicles and general traction

HARD ROCK LUG for all rock work

Sure-Grip, All-Weather—T.M.'s The Goodyear T. & R. Co.

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EXCAVATING ENGINEER

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A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

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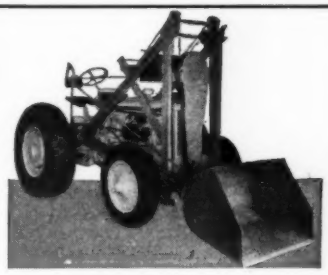
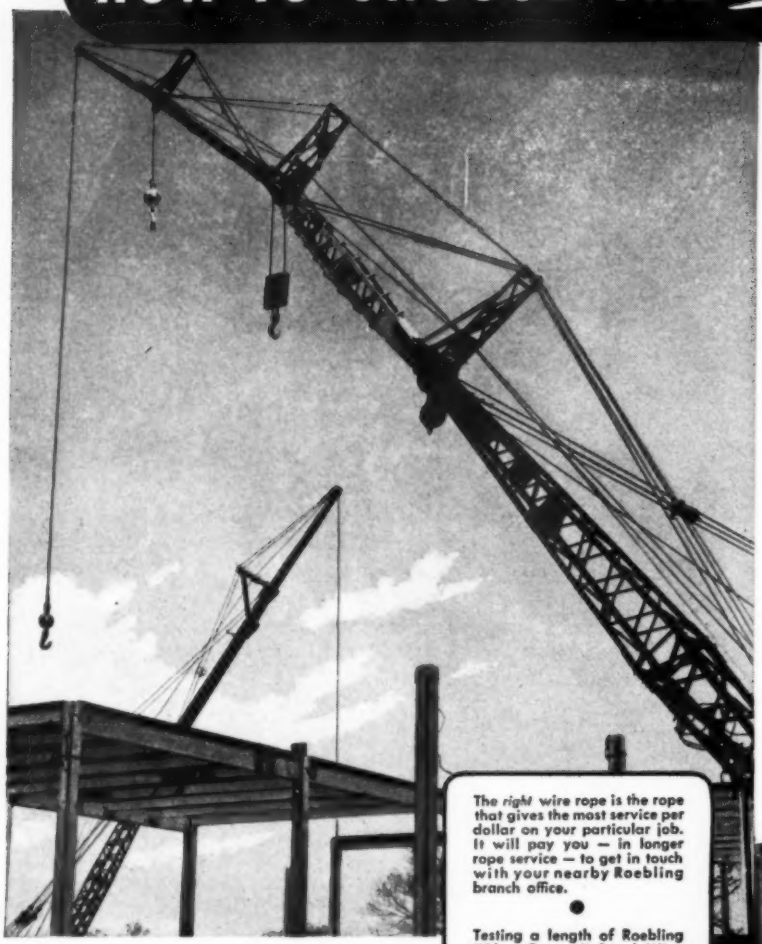


Front - End
LOADERS
For Industrial Tractors

Extensible Booms,
5/8-cu. Yd., Bucket 8-foot lift,
Backfiller Blades

White Mfg. Co.
ELKHART INDIANA

HOW TO CHOOSE THE *RIGHT* ROPE



. . . and get lowest handling cost!

YOU DON'T ALWAYS have the time to study the often obscure details affecting wire rope service on your installations. But your Roebling Field Engineer is constantly making such studies.

His daily contacts include tracking down the facts on practically every type of wire rope installation. He has specialized knowledge of wire rope usage . . . and of wire rope, too.

After careful study the Roebling Field Engineer can help you choose the *right* rope . . . the one that will give you top service per dollar. Of course, he will recommend Roebling "Blue Center" Steel Wire Rope. For here is a complete line—both preformed and non-preformed — where he can find the wire rope that combines the right balance of strength and flexibility, of fatigue and abrasion resistance.

Call or write our nearest branch office. Get in touch with your Roebling Field Engineer.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

The *right* wire rope is the rope that gives the most service per dollar on your particular job. It will pay you — in longer rope service — to get in touch with your nearby Roebling branch office.

●

Testing a length of Roebling "Blue Center" Steel Wire Rope is important—to you. It gives engineering data to your Roebling Field Engineer . . . information that can save your wire rope dollars.

Manufacturers of Wire Rope and Strand • Fittings • Slings • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Aerial Wire Rope Systems Electrical Wire and Cable • Ski Lifts • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers

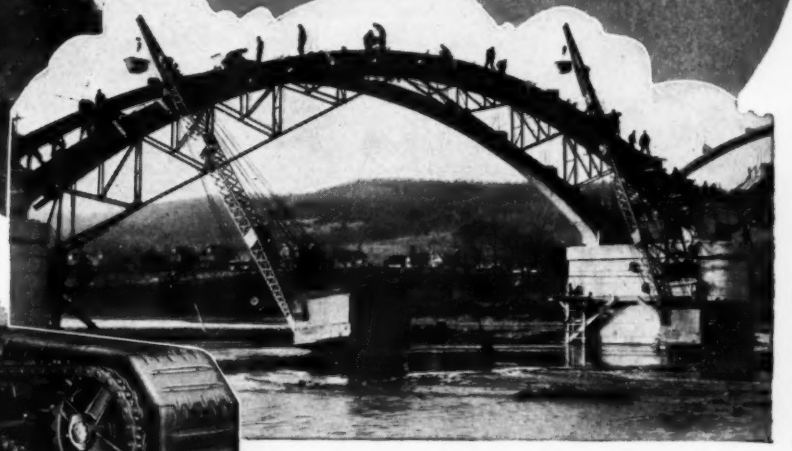
PREFORMED • NON-PREFORMED

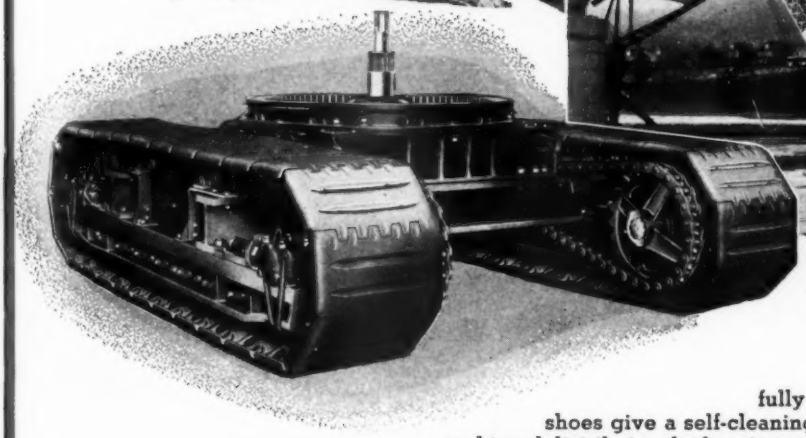
ROEBLING

PACEMAKER IN WIRE PRODUCTS

When you buy a SHOVEL CRANE or DRAGLINE

LOOK at these crawlers!





THERE *is* no other crawler like this! The crawler base is a heavy annealed steel casting proved in years of service. All travel gears are fully enclosed and run in oil. Alternate lugs on tread shoes give a self-cleaning action. A ball and socket action between roller and tread distributes the bearing pressure more evenly. The idler sprocket is without teeth, eliminating the jerky action common to ordinary crawler drives. Joints between treads are closed and smooth, eliminating the "nut cracker action" that chips tread shoes.

Half-length floating pins simply locked in, reduce wear and replacement in tread shoes. And most important of all—positive traction on both crawler belts while turning as well as when going straight ahead, on all the larger Northwests, assures full traction when you need it most, enabling Northwests to go where others have difficulty.

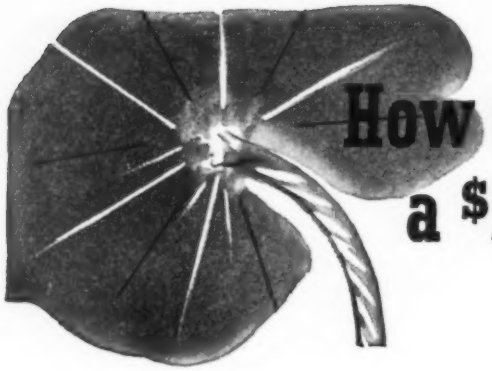
Plan well ahead for your Northwest. Let us send you details on the size that interests you.

NORTHWEST ENGINEERING COMPANY
1750 Steger Building • 28 E. Jackson Boulevard • Chicago 4, Illinois

If you have a REAL ROCK SHOVEL you never have to worry about output in dirt!

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



How to Pull the Fuse from a $20,000,000,000 Bomb

IMAGINE a super bomb whose explosion could rock the entire nation. Such a bomb EXISTS—*but you can help render it harmless.*

This bomb is $20,000,000,000 surplus national income.

Authorities estimate that this year's total income will be $155,000,000,000—personal taxes will total $15,000-000,000—consumer goods and services will absorb no more than $120,000,000,000. This leaves $20,000,000,000. Even if banks and insurance companies absorb one-fifth of the surplus (as they did in 1945), there will still remain $16,000,000,000 that could be used to bid up prices.

You're doing yourself, your company, and your country a favor by continuing your payroll deduction plan for the regular purchase of U. S. Savings Bonds. At maturity, they pay $4 for every $3 invested!

THE PEACETIME PAYROLL SAVINGS PLAN—

A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U. S. Savings Bonds.

THIS TIME IT'S FOR YOU

A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Savings Bonds.

Are you using these booklets?

If not, or if you want additional copies, just ask your State Director of the Treasury Department Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

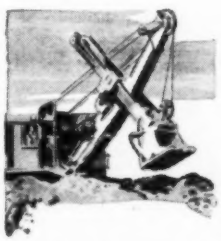
EXCAVATING ENGINEER

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council

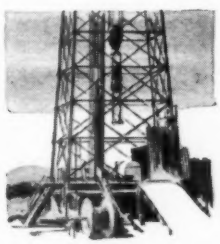
Your New Car is Coming . . .

How Wire Rope Contributes to it

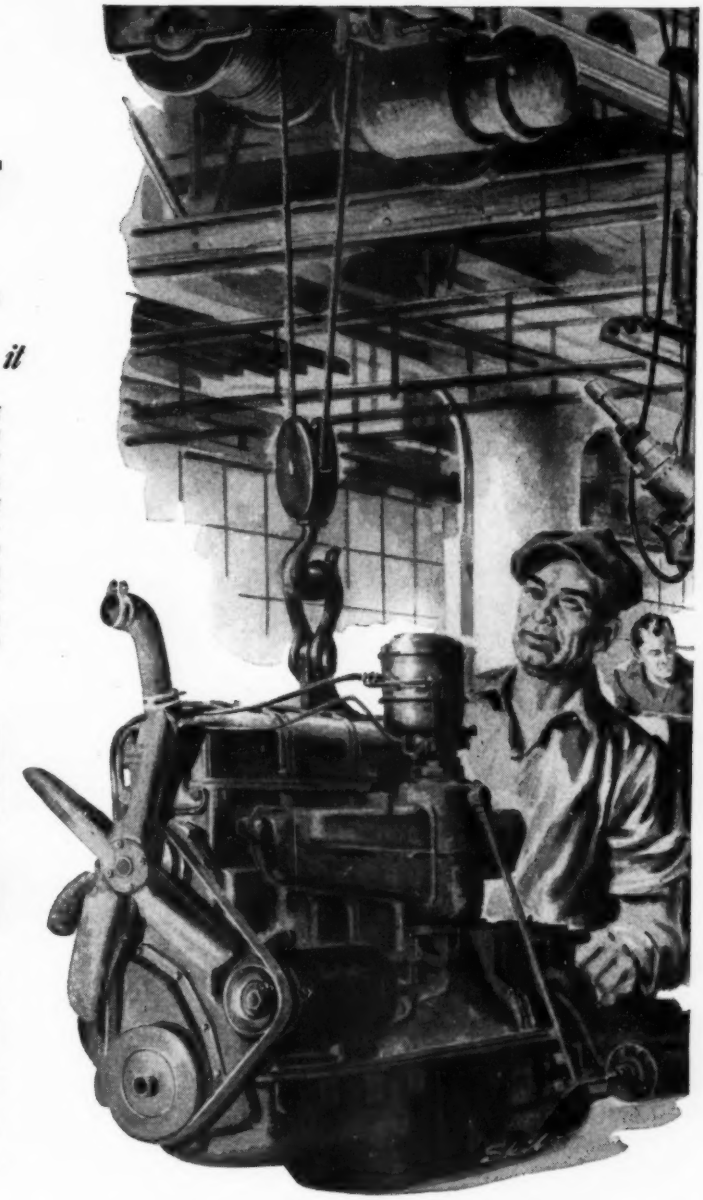
Automobile factories are working hard to get your new car to you as soon as possible. They use many cranes and hoists which depend on wire rope to transmit power to moving parts. Much of this wire rope is Preformed—because Preformed is more flexible and runs over small sheaves with minimum wear. This means it lasts longer. Preformed wire rope also resists kinking or twisting and so helps speed production.



Building of new roads over which you'll drive your new car is also speeded by using Preformed wire rope on shovels, bulldozers, scrapers, graders and concrete mixers. This modern wire rope spools evenly, reduces shutdowns for replacements.



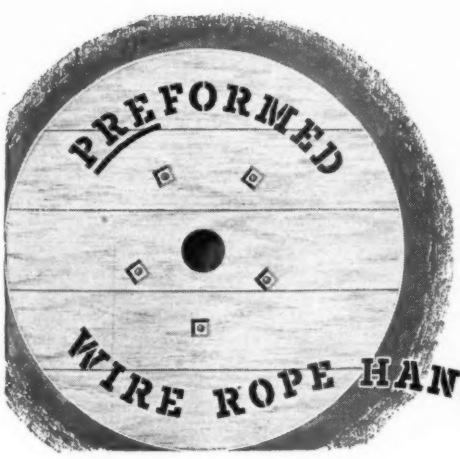
Oil that will run and lubricate your new car comes from fields where equipment rigged with Preformed wire rope is at work. Drillers like Preformed because it resists whipping, spools better on the drum. It also makes faster round trips.



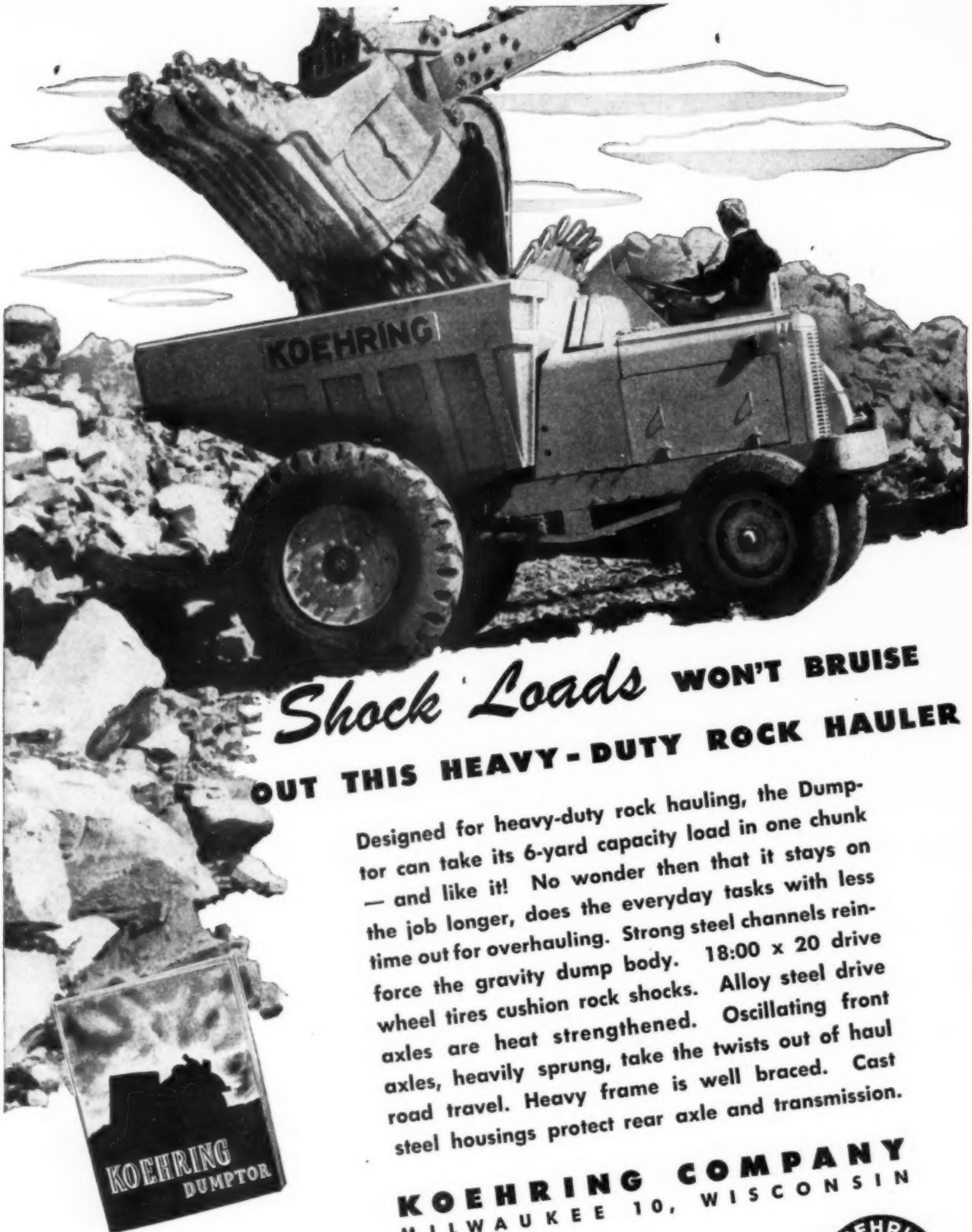
Preformed wire rope contributes to speeding production of your new car . . . building roads . . . drilling oil. Men in many industries which require a wire rope that must stand up under severe service specify Preformed. In fact, companies which change to Preformed find that its exclusive built-in features pay big dividends in time, money and efficiency. Preformed is the modern wire rope for modern machines.

Send for an interesting new free booklet, "PREFORMED WIRE ROPE—WHAT IT IS—WHAT IT DOES." Write the Preformed Wire Rope Information Bureau, 520 North Michigan Avenue, Chicago 11, Illinois, or

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR



HANDLES EASIER - LASTS LONGER



Shock Loads WON'T BRUISE

OUT THIS HEAVY-DUTY ROCK HAULER

Designed for heavy-duty rock hauling, the Dumptor can take its 6-yard capacity load in one chunk — and like it! No wonder then that it stays on the job longer, does the everyday tasks with less time out for overhauling. Strong steel channels reinforce the gravity dump body. 18:00 x 20 drive wheel tires cushion rock shocks. Alloy steel drive axles are heat strengthened. Oscillating front axles, heavily sprung, take the twists out of haul road travel. Heavy frame is well braced. Cast steel housings protect rear axle and transmission.

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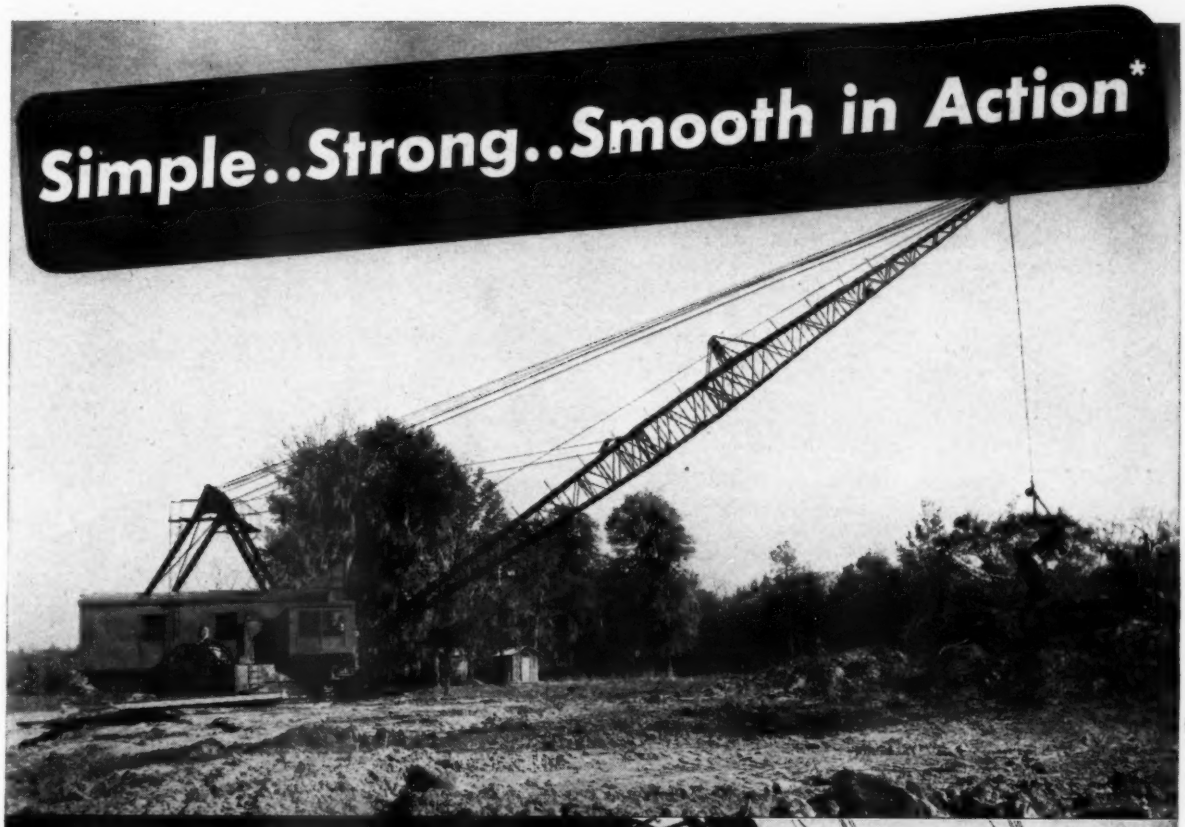


Three of Many Reasons Why
BUCYRUS-MONIGHANS
Are Years Ahead

BUCYRUS-MONIGHAN simplicity means smooth performance and minimum maintenance — in both digging and walking. Main machinery is not complicated by gadgets or by intricate gears and shafts that cause trouble and reduce efficiency. It is easily accessible for maintenance and well positioned for good rope leads and maximum counterweight effect.

In the walking machinery, too, there is very little to go wrong. By means of the smooth rotating and sliding action of the rolling cam, the walking cycle is executed without jerking or shock to the machinery. It's a walking action that lasts because parts are strong, few in number, smooth in action.

14M46C

BUCYRUS MONIGHAN

SOLD BY
BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

BAKER

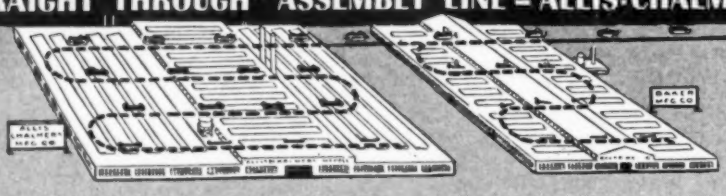
They Go Together! BAKER AC

Watch a Baker 'dozer in action, as it smashes through the "toughest going"— digs in and rolls out more yardage than any other 'dozer on the job. Powerful hydraulic *Down Pressure* on the cutting edge makes the difference. The blade sinks in, bites through stubborn earth — moves more yardage with fewer passes — yet the operator "takes it easy."

Baker *Down Pressure* is one big reason why more and more users are standardizing on Baker Bulldozers and Gradebuilders; why there are more Bakers on Allis-Chalmers Tractors than all other makes combined.

BAKER MFG. CO., SPRINGFIELD, ILL.

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

Allis-Chalmers TORQUE CONVERTER Boosts Tractor Output

A "flying" project from the start! Four A-C torque converter tractors really make the dirt fly on this million yd. airport project at Greenbelt, Md. Owner F. W. Schrom also speeds maintenance and finishing with an Allis-Chalmers Model A-D Motor Grader.

Below: Torque converters plus pusher loading . . . this is the way to really move dirt! Owner Schrom assures himself of fastest possible loading and hauling, capacity loads every trip, with this combination.

The Allis-Chalmers torque converter method of transmitting tractor engine power livens up tractor performance — gets much more work done.

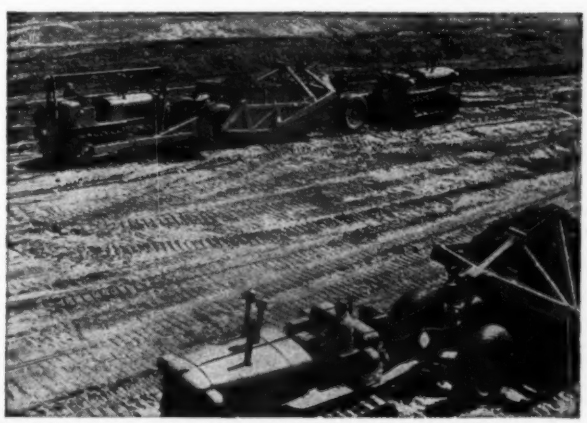
With a torque converter, highest possible speeds at which load can be moved are automatically selected in each of the three forward and reverse speed ranges. This gives you infinite working speeds in each gear — from zero to maximum. Assures peak tractor performance at all times. Keeps gear shifting to an absolute minimum.

There's no restarting, either. Engine cannot be stalled!

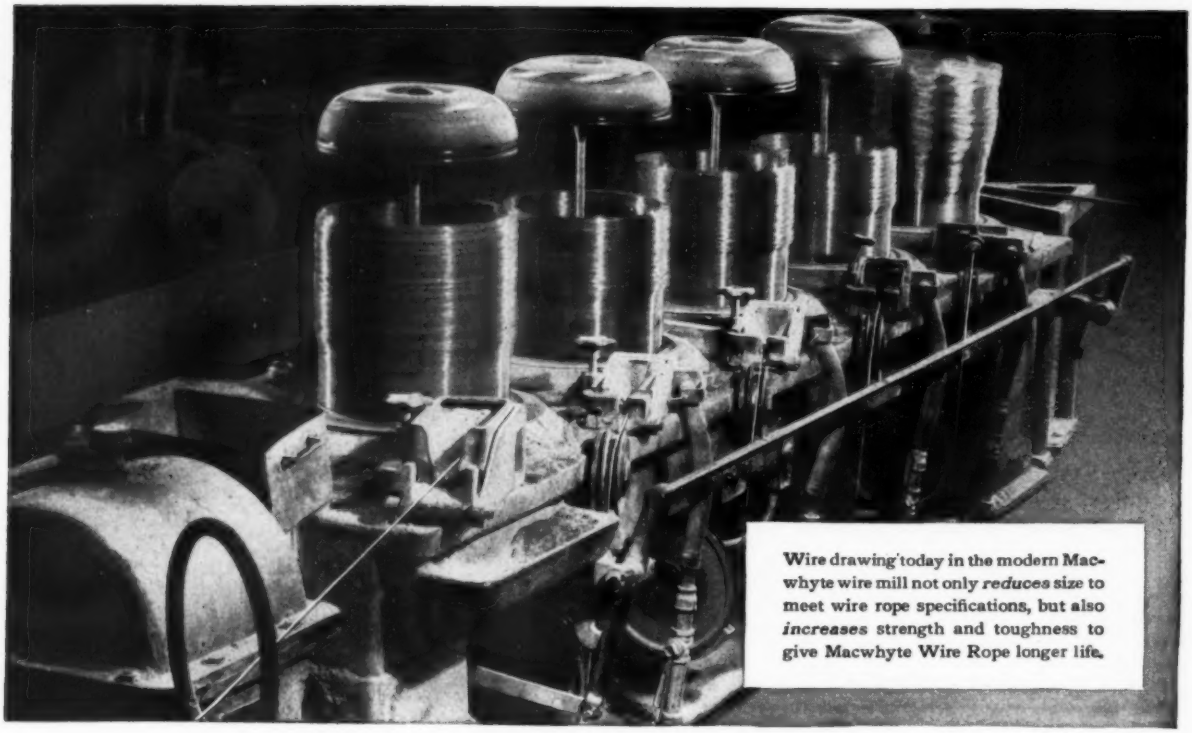
Operation is continuously smooth. Cushion of oil between engine and tractor train protects tractor and auxiliary equipment from shock and abuse. There's more time on the job . . . less money spent on repairs, overhaul!

Operators go for it, too! Smooth, easy operation, less gear shifting, means less fatigue — more work done!

Yes . . . moving dirt with torque converter tractors is a new construction experience . . . worth your immediate investigation.



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



Wire drawing today in the modern Macwhyte wire mill not only *reduces* size to meet wire rope specifications, but also *increases* strength and toughness to give Macwhyte Wire Rope longer life.

Metal flows cold

TO INCREASE YOUR DOLLAR VALUE

in Macwhyte Wire Rope

You get a better, longer lasting Macwhyte Wire Rope, because we cold-draw rope wire from heat-treated wire rods.

Tungsten-carbide dies, polished to a satin-finish with diamond dust and oil, are used. The wire is p-u-l-l-e-d through the dies cold. This results in an extremely smooth round wire of practically double strength with great flexibility to resist bending fatigue.

Precision Wire drawing by Macwhyte (exclusively for Macwhyte Wire Rope) is another reason why Macwhyte PREformed internally lubricated wire rope is your best buy.

Here's a helpful wire rope buyer's guide: The 170-page, completely indexed Macwhyte G-15 catalog will be sent free if you are a wire rope user. Just write or call any Macwhyte distributor.

NO. 861

MACWHYTE COMPANY 50th Year 1896 – 1946

MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company

2903 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: **New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle San Francisco • Los Angeles • Distributors throughout the U. S. A. and other countries**

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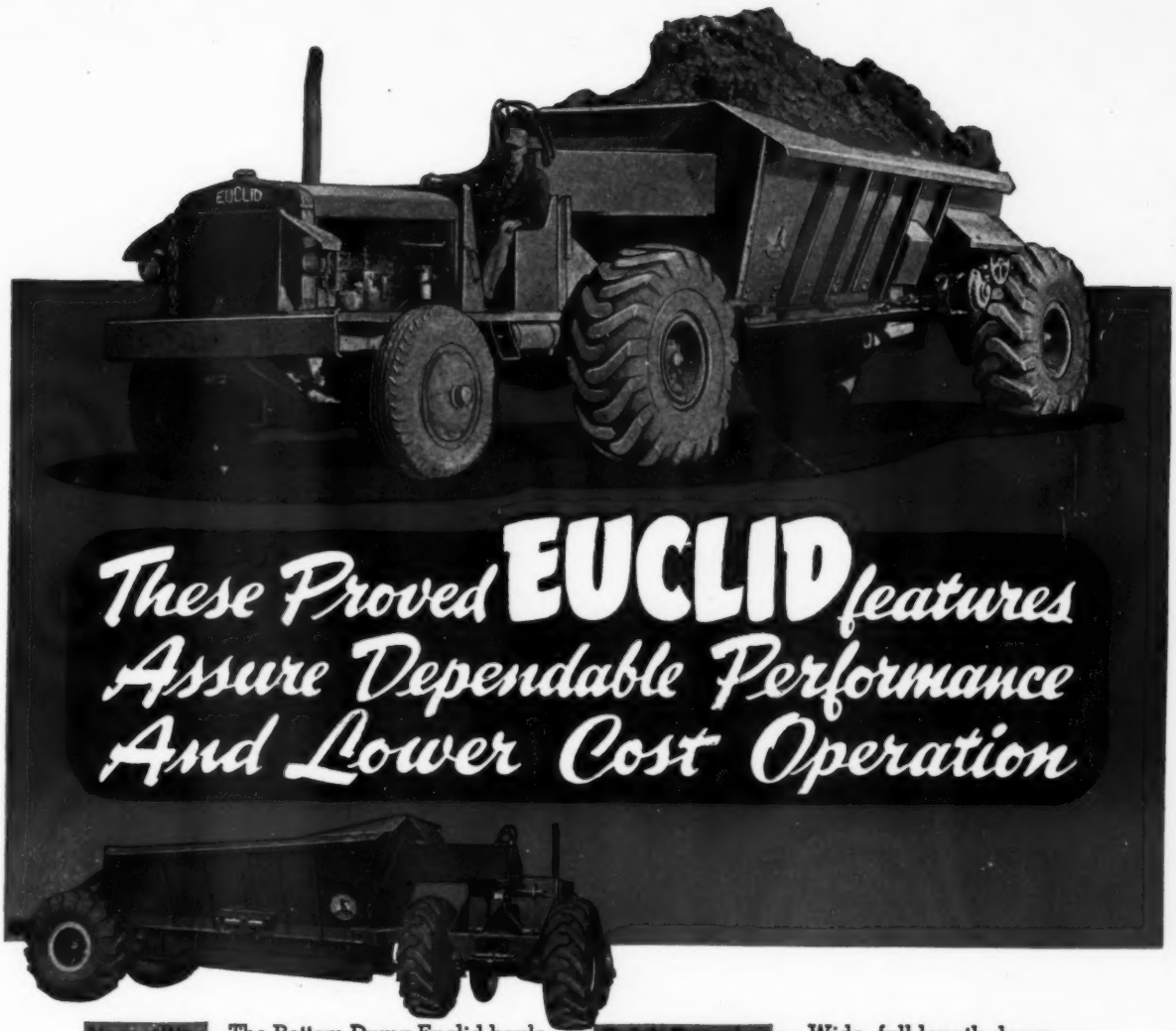

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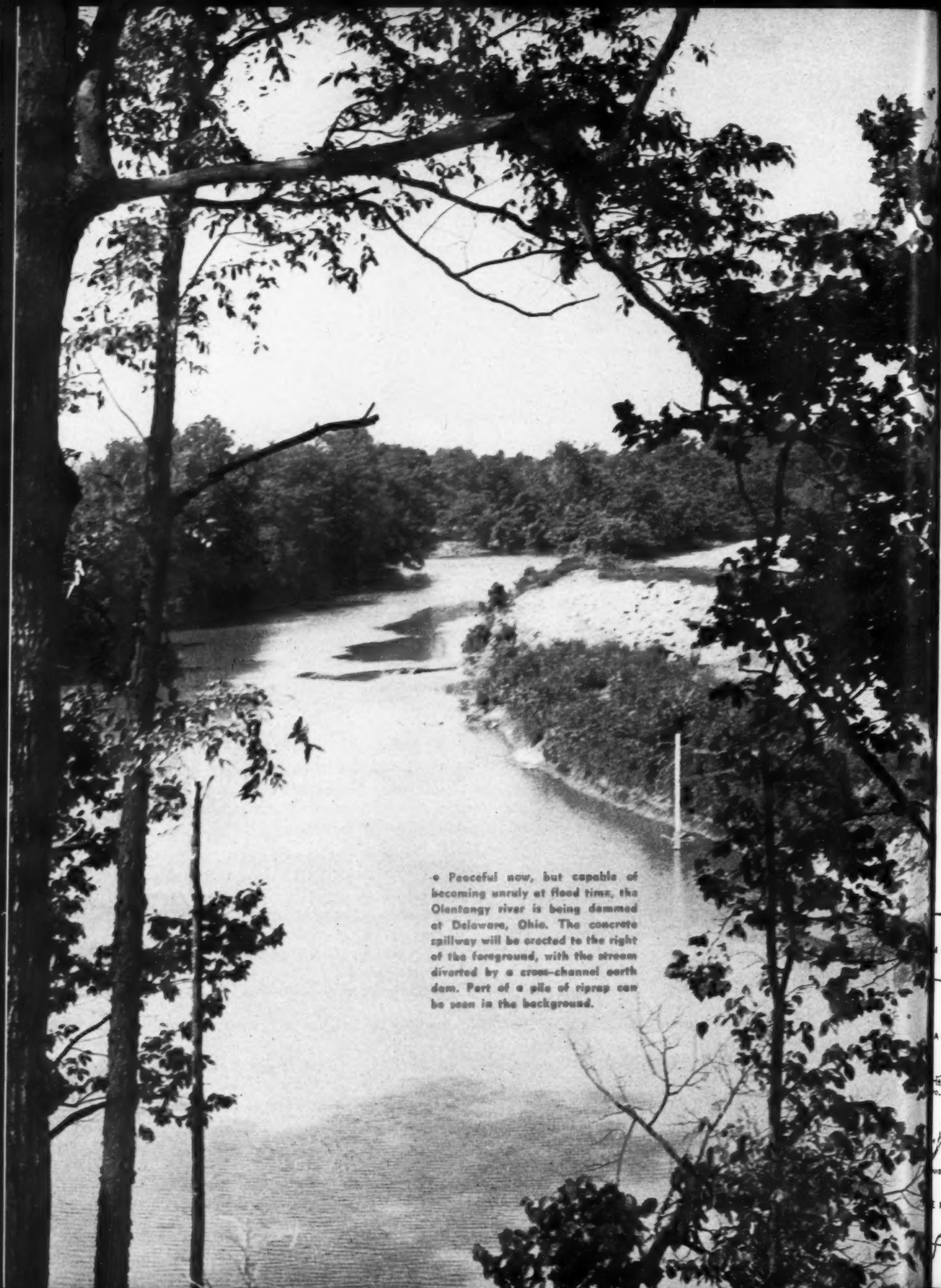
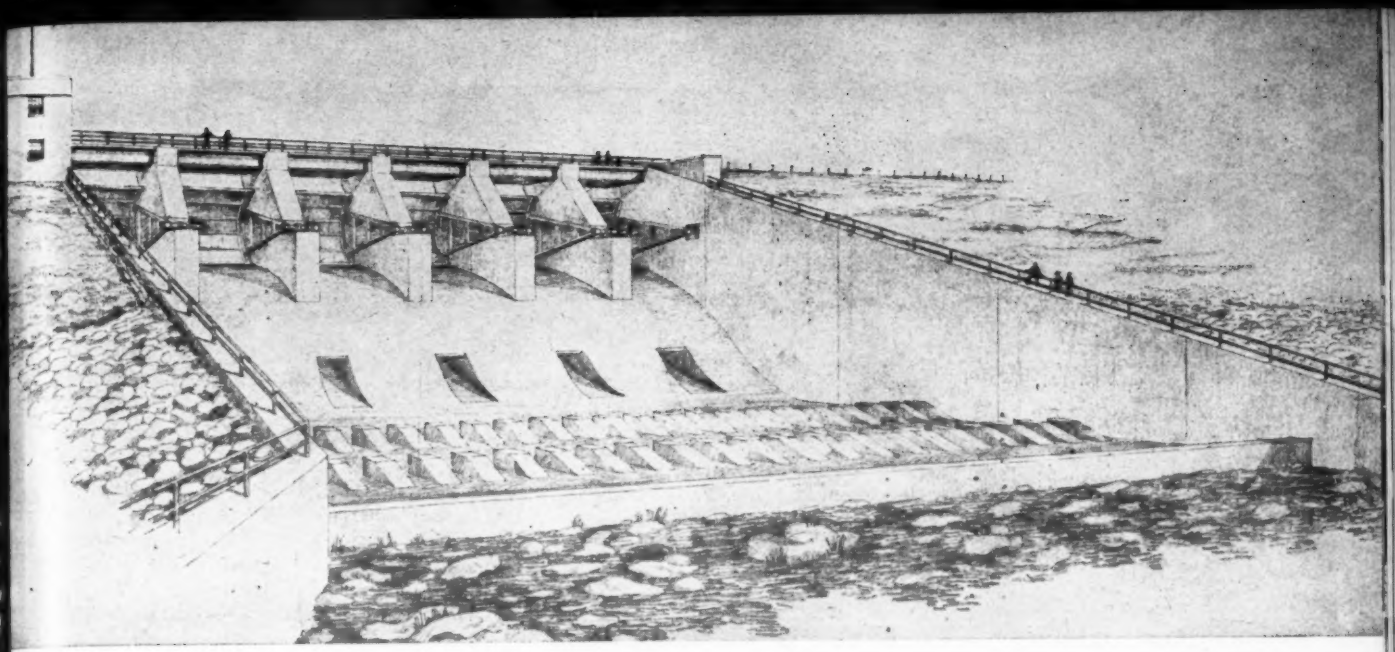


• Peaceful now, but capable of becoming unruly at flood time, the Olentangy river is being dammed at Delaware, Ohio. The concrete spillway will be erected to the right of the foreground, with the stream diverted by a cross-channel earth dam. Part of a pile of riprap can be seen in the background.



Ohio's Delaware Dam

NORMALLY, THE OLENTANGY river is manifestly a peaceful stream as it slowly idles its way southward to join the Scioto, a tributary to the Ohio, near Columbus. Yet the Olentangy has been known to do a Jekyll-and-Hyde change, and on at least one occasion—in March, 1913— it staged a flood that is still well remembered by many of the citizens living in the Olentangy's 381-square-mile drainage area.

Estimated discharge at Delaware, Ohio, during this flood was 35,000 cu. ft. per second and local damage was considerable. The flood had at least a slight effect on flood crests in the Ohio and Mississippi rivers. The cumulative effect of such floods occurring on Ohio tributaries is, however, considerable, a fact which gives rise to something quite different from the long-held defeatist attitude toward flood damage.

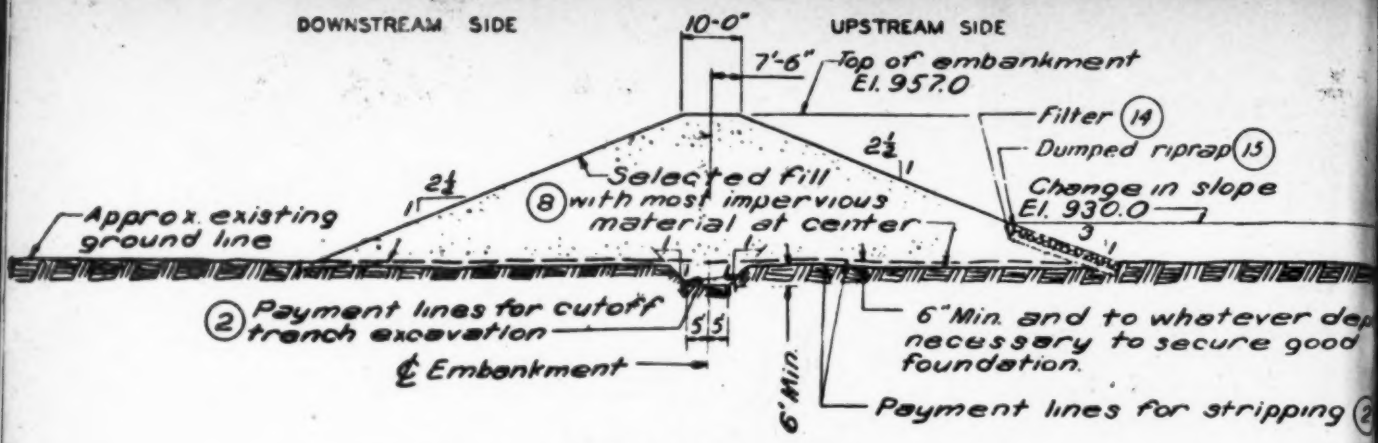
The belief that such damage constitutes an unnecessary evil produced a reservoir control plan entitled, "The General Comprehensive Plan for Flood Control, and other purposes, in the Ohio River Basin." This plan calls for the construction of 57 large reservoirs along tributaries of the Ohio. One of these will be impounded behind Delaware Dam—an earth fill type structure with concrete spillway now being constructed on the Olentangy River about five miles north of Delaware, Ohio, in Delaware County.

Engineered and supervised by the U. S. Engineers, this dam will be about 19.000 ft. long and will have a maximum height of 90 ft. The entire job involves the placing of roughly 1,050,000 cu. yds. of fill and the placing of 75,000 cu. yds. of concrete.

The masonry dam will consist of a 232-ft. spillway flanked by abutments measuring 298 ft. in length and having 140-ft. downstream wingwalls and 66′-6″ upstream wingwalls. The abutments and wingwalls will serve to retain the earth fill of the embankment and to prevent overflowing water from spreading outside the stilling basin.

The spillway will have five pier sections, each with a 6½′ x 6½′ sluiceway, or conduit; a fixed crest which is 55 feet from the bedrock foundation; six radial crest gates each 32 ft. long and 25 ft. high, and a baffled stilling basin measuring 66′ 6″ x 232′. The six radial crest gates will be operated by means of individual electric hoists mounted at the tops of the piers. while discharge through the conduits will be controlled by hydraulic lift gates having their operating mechanism in a gallery running through the spillway.

Johnson, Drake & Piper, Inc., S. J. Groves & Sons Co., and Bowen & McLaughlin, a joint-venture, undertake a $2,289,000 contract for building a 19,000-foot-long earth fill dam with concrete spillway on the Olentangy river at Delaware, Ohio. This project, involving 1,050,000 cu. yds. of borrow excavation, 175,000 cu. yds. of common excavation, and 10,000 cu. yds. of rock excavation, is U. S. Engineer-



TYPICAL EMBANKMENT SECTION

The five conduits will have a discharge capacity of 9500 cfs. with the reservoir at El. 947. At this writing, the decision as to the elevation at which the reservoir will normally be carried has not been made; however, the reservoir capacity when entirely full will be 131,000 acre feet, covering approximately 8600 acres of land; at El. 910, the reservoir will have a capacity of 8600 acre feet and cover 900 acres of land; at El. 922, it will have 24,000 acre feet capacity and will cover 1800 acres.

Before final selection of the dam site was made, U. S. Engineers investigated three possible sites, all within a two mile span in the Olentangy valley where this valley is narrow enough to permit dam construction which would not require prohibitive quantities of materials. The possible sites included the chosen one, another 1500 ft. downstream, and a third 4200 ft. upstream. Storage capacity in the cases of all three sites, study revealed, would have been about the same. The upstream site would, however, have necessitated major highway and railroad relocations, whereas bedrock at the downstream site was found to occur 20 feet lower than at the selected site, a fact which also would have added materially to the cost of constructing the dam.

Foundation and soil conditions were investigated by means of core drilling auger borings, test pits, and seismic surveys. Borrow areas were investigated by means of auger holes and test pits. The results of this subsurface exploration revealed that conditions at the site selected were favorable for the kind of dam structure which was to be built.

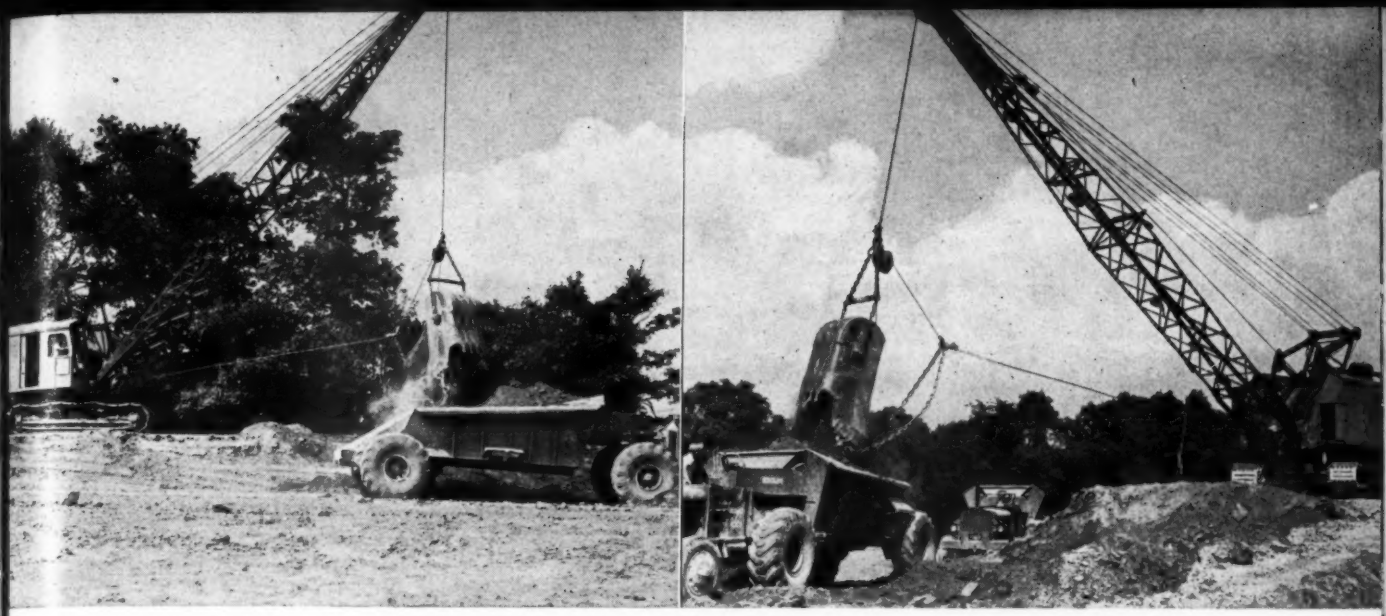
Invitation for bids for the Delaware Reservoir Project construction contract was made on January 23, 1946, with bidders given until February 14 to submit bids. A low bid of $2,289,000 won the contract for building the dam and appurtenant works for the joint-venture of Johnson, Drake & Piper, Inc., New York City; S. J. Groves & Sons Co., Inc., Minneapolis, and Bowen and McLaughlin, Phoenix, Arizona. The contractor is known for convenience locally as DGB&M Constructors.

Contractor was given notice to proceed on March 22, 1946, and work was started less than ten days later. The contract called for completion of the dam and appurtenant works 510 calendar days after notice and contained clauses stipulating a penalty of $250 for each calendar day of delay until the work is in operating condition subject to the approval of the contracting officer, and $50 for each calendar day of delay until the work is completed and accepted.

Principal features of the job include: (1) diversion and care of the stream during construction; (2) common, rock, and borrow excavation; (3) foundation treatment; (4) construction of earth dam; (5) construction of concrete dam; (6) fabrication, assembly, and installation of service bridge, crest gates, sluice gates, and sluice gate operating system, emergency bulkhead, etc.; (7) installation of crest gate operating machinery; (8) control house; (9) electrical work; (10) plumbing; (11) access roads and ramps; (12) miscellaneous drainage structures, and (13) painting.

The bulk of the stripping, excavating, and earthmoving work was subcontracted to J. C. O'Connor & Sons, Inc., of Ft. Wayne, Indiana. When the dam site was visited early in August, the subcontractor had virtually completed the east embankment and was well along in constructing the

• A 14-cu. yd. LeTourneau scraper dumps fill on a portion of the west embankment. In background, tandem Grace tamping rollers, drawn by a Caterpillar D-8 tractor, compacts fill.



• Borrow material is hauled out of opposite sides of the same pit in Euclid wagon loaded by 1½ and 3 cu. yd. Northwest draglines.

west embankment on the opposite side of the river.

The entire area of the earth dam was stripped and spoiled and the spillway site stripped with four 14 cu. yd. LeTourneau scrapers drawn by Caterpillar D-8 tractors. The stripping operation, which involved removal of approximately 30,000 cu. yds. of dirt, was not handled as a continuous operation. As area was required for preparing the foundation for the 19,000-ft.-long embankment, that area was stripped and prepared. Usual distance of scraper haul was 400 ft. The scrapers averaged ten trips per hour each, moving an average of 120 cu. yds. of dirt.

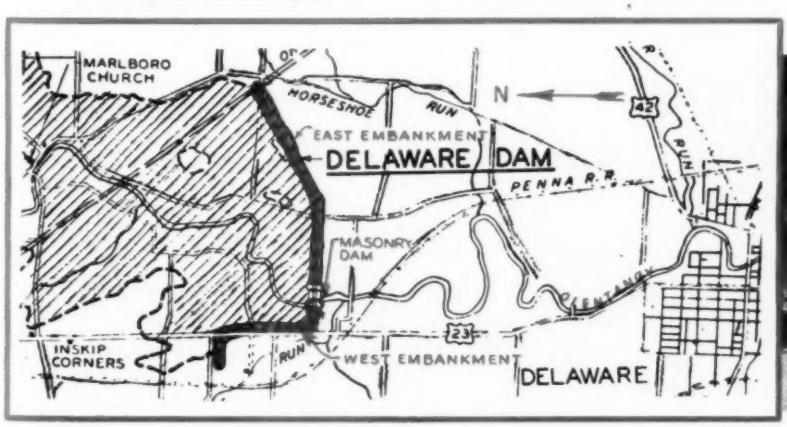
Specifications called for cutting an 18,000-ft. inspection ditch along the axis of the dam to expose underground utilities and soil conditions. Excavating this ditch to the specified minimum depth of six feet and width of ten feet was handled with a ¾-cu. yd. Northwest back-hoe, which dug from 150 to 300 lineal feet per day, with the average about 200 feet. Excavated material was dumped beside the trench and later backfilled with three Caterpillar D-8 tractors equipped with LeTourneau bulldozers. Backfilled material was compacted by means of sheepsfoot tamping rollers.

The east embankment, which extends from the spillway site eastward roughly a mile and then bends sharply northeastward, was constructed first and virtually completed in about three months, an operation involving the placing of 500,000 cu. yds. of fill. Fill material was obtained from four borrow areas previously determined by U. S. Engineer exploration and designated in the contract drawings. Borrow areas were located from 500 to 1600 ft. from embankment work.

The west embankment, in the process of construction during the writer's visit, curves away from the east-west axis of the masonry dam and extends due northward for almost a mile, bending to the left at right angles for almost another quarter mile. It requires about 550,000 cu. yds. of fill.

In building the embankments, the subcontractor used principally a combination of tractor-drawn self loading scrapers and eight 13-cu. yd. bottom-dump Euclids loaded by draglines. One dragline loaded on each side of borrow pit and scrapers loaded in center. The scrapers were four 14-yd. Le-

• Colored area shows extent of earth embankment which are connected by the concrete spillway.



• A 2000-gal. tank truck, used for sprinkling to give earth fill the proper moisture content, loads at a clearing along a bank of the river.

• Steel piles are swung into place by a Bucyrus-Erie 44-B crane during erection of a cellular sheet steel coffer dam. In middle background, a 3-cu. yd. Northwest dragline excavates dirt at the spillway site while Right: a Lorain Moto-Crane assists in erecting the concrete mixing plant.

Tourneaus drawn by Caterpillar D-8s. The Euclids were loaded by two Northwest draglines: one with a 3-cu. yd. bucket on a 50-ft. boom, and the other with a 1½ cu. yd. bucket on a 50-ft. boom. This pair of draglines excavated in the borrow areas to a depth of about four feet.

Daily cubic yard output for the scrapers ranged from 4000 to 7500, with an average of 6000, while the bottom-dump wagons placed from 2200 to 4600 cu. yds. per day, averaging 3500 yds. Average daily yardage for the 3-cu. yd. dragline was 2800 cu. yds. and 2000 cu. yds. for the 1½ cu. yd. machine.

Earth obtained from the borrow areas, plus earth excavated from the spillway site, was dumped on the previously prepared embankment foundation area and spread by three Caterpillar D-8-LeTourneau bulldozer combinations. Finished grades were obtained with a Caterpillar Road Patrol with 12-ft. blade and a Caterpillar hand operated road grader, also equipped with a 12-ft. blade.

Fill was spread in eight-inch layers and watered by means of two 2000-gallon tank trucks. The moisture content of the fill material was adjusted to the optimum as determined by the American Association of State Highway Officials Method T-99-38.

Contract specifications required compaction of the embankment fill by means of at least four passes with special sheepsfoot tamping rollers for each eight-inch layer of fill. The rollers specified were water-tight cylindrical drums at least 48 inches long, with tamping feet projecting not less than seven inches from the surface of the drum and spaced between six and ten inches apart, measured diagonally from center to center. Tamping feet were required to have a face area of at least six square inches, but not more than eight square inches. Rollers produced 400 lbs. pressure per square inch on the combined areas of the tamping feet in one

• Below: Rock excavation for the Stellway Foundation is loaded to bottom-dump wagons by a ¾ cu. yd. shovel; while a 3-cu. yd. dragline removes earth overburden. (Right) Drilling of rock foundation was handled with Worthington jackhammers.

row parallel to the axis of the drum.

To meet these specifications, the subcontractor used special Grace tamping rollers drawn in tandem behind a Caterpillar D-8 tractor and an Allis-Chalmers Model L gasoline-powered tractor.

To promote proper drainage, the central portion of the embankment section was slightly crowned, permitting surface water from rainfall to drain freely toward the slopes.

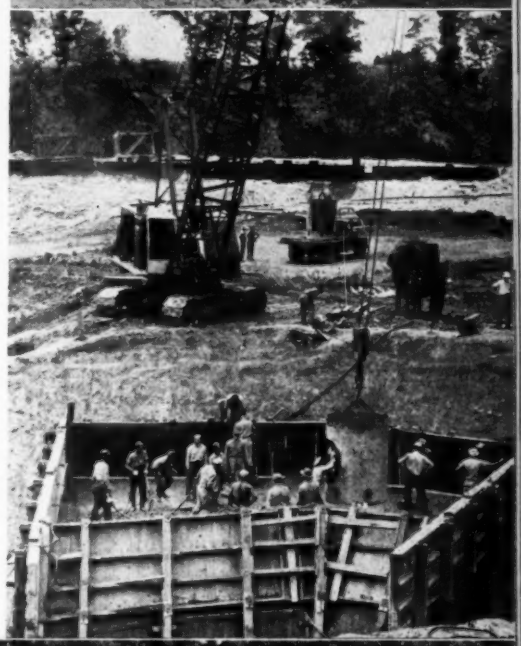
The best, or most impervious, materials were used in the middle third of the rolled embankment, the more pervious materials being restricted to the upstream and downstream thirds of the embankment section. The upstream portion of the embankment below El. 930 will be protected with dumped rip-rap, made up of individual pieces not exceeding 24" in thickness and having a minimum dimension of four inches and weighing 10 to 150 lbs. each, with not more than 15% by weight of the total volume composed of stones weighing less than 35 lbs. each. The downstream portion below El. 900 will be protected against high tailwater with derrick stone, each weighing not less than 1000 lbs. and not more than 10,000 lbs., with 70% by weight weighing one to three tons. Rip-rap and derrick stone are obtained from the rock excavation at the spillway site.

The job of stripping and excavating the spillway site down to bed rock involved approximately 85,000 cu. yds., of which about 10,000 cu. yds. was rock excavation. The same scrapers, Euclids, and draglines used for building the embankment were used to excavate the overburden to bedrock, which occurred at about El. 870 while the surface elevation at the site averaged around 900.

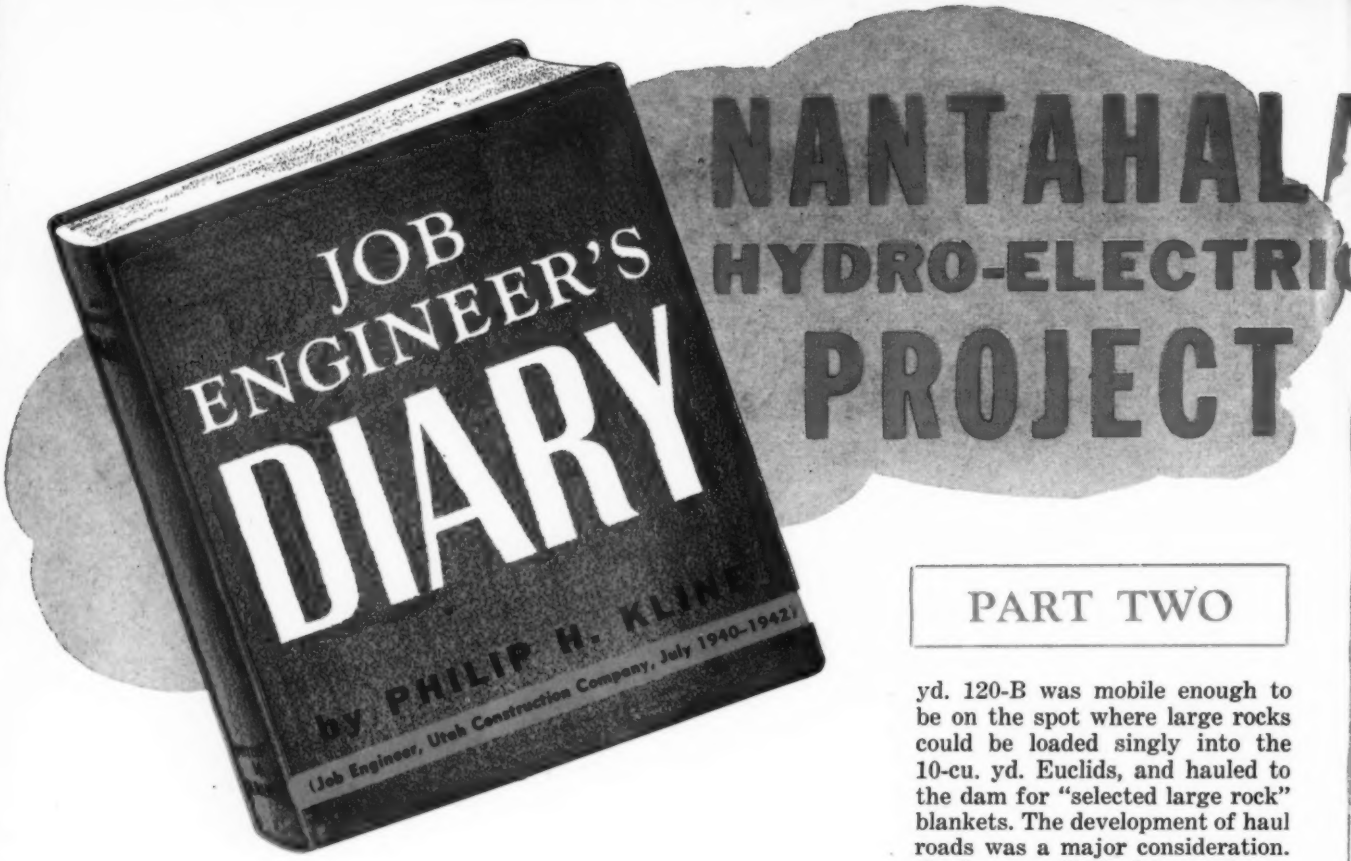
Preparation of the limestone bedrock for excavating was han-

(Continued on page 580)

• Upper Photo: A flat bed truck carrying a 2 cu. yd. Dravo-Doyle bucket is loaded in an underpass beneath the C. S. Johnson concrete plant. Lower: Concrete placed in abutment monolith is vibrated by means of Vibra Spades and Viber vibrators.



• Concrete is placed in forms of abutment monoliths by a Bucyrus-Erie 54-B crane swinging a 2-cu. yd. concrete bucket on a 100-foot boom. The crane in the foreground places concrete forms.



PART TWO

This is the second installment of the job engineer's diary reporting Utah Construction Company's weekly construction progress on the Nantahala Hydro-Electric Project. Nantahala Dam and appurtenant works was constructed in the uplands of North Carolina for the Nantahala Power and Light Company, a subsidiary of the Aluminum Company of America, to increase power facilities. The author gives emphasis to excavation in his report of plant and equipment used, descriptions of setups and performances, job quantities and conditions involved, special features of the job, summaries of various records and history which are interspersed with the author's observation.

April 8—"Grand Strategy" was the code word for the heavy material movement that lay ahead of us. From the many varied considerations. of quarrying methods, haul road locations and sequence of operations, a master plan was developed that set forth the areas to be worked and the disposition of the material obtained and required in the dam. In general the scheme adopted called for major operations on the right bank where a narrow quarry floor was developed at the level of the crest of the dam. The hillside behind this working platform was divided off into 11 sections, each of which would be shot "en masse," mainly from small tunnels driven perpendicularly into the face and from laterals branching out at right angles to those main drifts. These small tunnels or "coyote holes" could be worked individually with a relatively small amount of equipment and without interference to adjacent operations.

April 15—Loading and hauling thus became an orderly procedure as the large masses of well-fragmented rock were brought down in concentrated piles. The 5-cu. yd. 120-B was mobile enough to be on the spot where large rocks could be loaded singly into the 10-cu. yd. Euclids, and hauled to the dam for "selected large rock" blankets. The development of haul roads was a major consideration. Grades were limited to a ten percent maximum and only for short ramps, the general grade being six percent. Since the area at the base of the dam was so large, concurrent operations could be arranged at both upstream and downstream locations. It was also thus possible to direct loads to the proper portion of the dam according to the character of the rock, inferior grades being sent to less structurally important sections of the fill.

April 22—Not all of the equipment listed on page __ can be constantly available for quarry rock operations. The bulk of the job will be done by two of the 2½-cu. yd. Northwests, and the 5-cu. yd. Bucyrus-Erie. From 13 to 20 Euclid 10-cu. yd., six-wheel, diesel powered trucks will haul usable and waste material from 600 to 6000 ft., depending on fill and supply locations. Three to six Caterpillar RD-8 tractors and bulldozers will clean up work piles while a Caterpillar No. 12 Motor Patrol Grader will keep on the go 24 hours a day, maintaining the upwards of 20 miles of road on the entire project. All operations will go forward on three 7½-hour

shifts. Full speed ahead! Time's a-wastin'!

April 30 — And the "coyote" boys have not been idle. Nearly a thousand feet of main drift and laterals have been dug. Pockets were provided for dynamite charges of 125 cases each, more or less. Careful plotting of these chambers in relation to overburden and volumes of rock to be moved were obtained from five-foot contour maps taken just before each shot. Expert judgment of the character of the rock and action of the powder was obtained from Atlas Powder Company representatives in collaboration with veteran company men. There are 15 such shots planned, five in the present face, others stepped back to the new face which the preceding shots will develop. All operations of loading and hauling rock will be thus kept on the same quarry floor level and truck and shovel ramps will be avoided.

May 8 — Dynamite of various grades and characteristics was used in this operation. Single cartridges seven inches in diameter and 50 inches long came in individual boxes, and had a velocity rating of 20,000 feet per second and weight strength of 90. Other ammonia gelatins in conventional sizes and medium characteristics were used as well as some Atlas "Quarry Special" free-flowing bag powder. Cartridges carrying exploder caps were left in their boxes, but other sticks were removed and stacked closely together in the tunnel chambers. Extreme care was used in loading the holes and in keeping track of the large quantities of explosives needed close at hand.

May 15—Slightly over 125,000 lbs. of powder have now been exploded in four shots with an estimated breakage of over 120,000 cu. yds. solid measure. Five other holes have been started which will bring down the yardage as needed. Driving contracts are given experienced mining crews to prepare the "coyotes." Portal set, powder chambers, loading and backfill (tamping) and other work was done by company forces.

The drilling was done with heavy drifter drills mounted on short columns and bars and with hand-held pneumatic drills, generally on a 10 to 15-hole draw-cut pattern. Mucking was entirely by hand, hauling out by small wheelbarrows to a temporary muck pile near the portal. This material was later used to backfill the holes after loading. The average bore was four feet wide by five feet high, containing about ¾ cu. yd. per running foot.

• Above: Bulldozer on slope working on cables on Penstock common excavation, while Bucyrus-Erie 1 cu. yd. shovel works on power house excavation in foreground.

May 22 — Two well drills, a

• Downstream end of quarry in spillway showing various equipment and haul roads.

• Before and after view of a coyote shot. Note tree trunks in circle on both top pictures indicating same site. To the right is a view of a coyote entry and below is an example of the resulting fragmentation.

Keystone No. 53 and a Bucyrus-Erie 24-L, both gas driven, have now been added. They will sink ten six-inch diameter holes, ranging from 46 to 80 feet deep along part of the rim of the present cut. These will assist holes coyote Nos. seven and eight to be shot about the middle of June. Wagon drills have been used to augment the shooting pattern. They have prepared nearly horizontal "snake" holes into the toe of the existing quarry face. These are 18 to 30-ft. holes to take 100 to 150 lbs. of 1¼-inch powder each. At the completion of each large shot, it was generally necessary to put some men on ropes to use "sinker" drills for blasting out dangerous overhanging rock and to assist in shaping up new faces for successive holes.

May 30—It might be mentioned that secondary shooting has not been considered serious. Also in addition to the ½ to 1 end slope anticipated in the solid yardage computations, we are getting considerable overbreak which brings us extra rock down on the quarry floor. Stripping of the relatively thin layer of dirt above the rock has not been necessary due to the small proportion involved in the large quantities of usable material obtained.

June 8—Before we go on with the tremendous activities at the dam, let's not forget that major operations continue on all four tunnel headings, although shaft excavation is pretty well along by now. Details of the tunnel progress will be reported later. At the power house, the excavation is complete with around 10,000 cu. yds. removed, much to neat excavation lines in solid rock. The tailrace had 31,000 cu. yds. of common and 21,000 cu. yds. of rock excavation according to preliminary estimates. Penstock stripping and saddle piers and pipe anchor-block holes are being rushed on the steep ridge above the power house.

June 15 — Material is really moving now. Two more "coyote" shots brought down 260,000 cu. yds., solid measure without overbreak. The shots used 103,000 and 153,450 lbs. of dynamite each. The latter was a "lulu;" I suspect I'll have more to report on it next week. Four holes were loaded and shot at once on May 22, one hole underlaid a volume of rock measuring 60,000 cu. yds. solid and taking only 49,000 lbs. of dynamite. The second shot, yesterday, had the greatest solid yardage yet removed. One series of laterals shot down 57,000 cu. yds., solid; and another series, shot at the same time, had over 90,000 cu. yds. solid, above them. The well

• Upstream blanket removed. To be replaced with Class "A" rock.

drill holes at the top of the face, extended down to the quarry floor, and assisted in carrying the quarry floor back the desired distance.

June 22—"The" shot, reported last week, gives some idea of the dangers involved in this type of excavating. Instead of heaving and dislodging all the rock as expected, some part of this explosion "broke through" and hurled rock in front of it at great force. An entire portion of the hillside across the canyon, some 1400 feet air line from the face, was stripped of standing timber from eight inches to 24 inches in diameter. Some rocks ½ cu. yd. in size were found buried in the ground as far as 600 yards from the shot.

June 30 — In describing the foregoing interesting procedures we have fallen behind on other important developments. The dam fill has now been extended across the entire old river bed. The closure of a coffer dam has been made, and the diversion tunnel is carrying the full river flow. Impervious material haul has been started and a crusher plant for the filter zone rock is in operation.

July 8—The story of the crusher plant is worth some attention. Besides a portable crusher plant, a Kennedy-Van Saun jaw crusher and Robins "Gyrex" screen served three conveyor flights carrying sand, 3-inch, and 10-inch rock to stockpiles. The quarry shovels selected portions of the broken rock from coyote shots, and the Euclid trucks hauled the material across the quarry floor to a grizzly and chute which fed the primary crusher.

July 15 — At the toe of the stockpiles, overhead gates released materials into Koehring Dumptors (6 cu. yd.). New haul roads were bladed from those "traps" to various levels of the dam fill. In this way up-hill hauls were kept to a minimum and the speed and maneuverability of these hauling units was best utilized.

July 22—In spite of the large amounts of material excavated, it is pressing hauling units to keep up to the demand. There are now so many uses for the material, and the crusher stockpiles must be built up and maintained. Time studies are being made so that best corrective measures may be taken, where needed. Progress graphs and running inventories of all major operations are maintained in the general superintendent's office, and daily reports show production of all major loading units, by shifts and class of material.

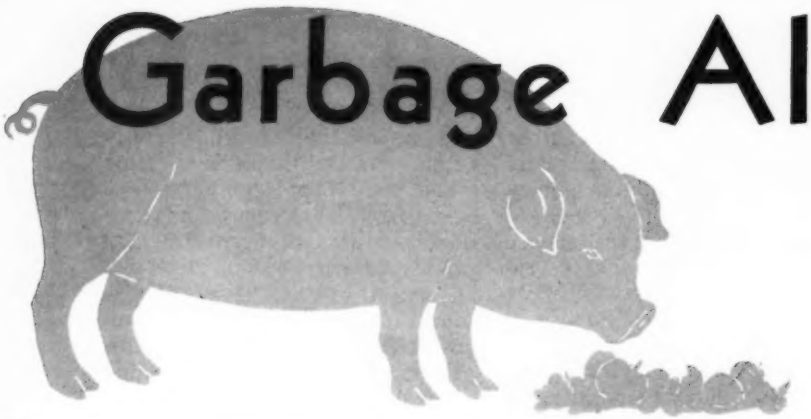
July 31—An important contribution to the crushed rock supply, both for the dam and for concrete aggregate, and one which relieved

(Continued on page 588)

• **Right: Powerhouse and penstock from tailrace embankment. Concrete generally to top of substructure elevation 1908. Penstock pipe to station 11 + 60±. Superstructure columns started. Tailrace backfill and septic tank in foreground. Below: A full load of tunnel muck from Heading 2-3 to go to dam for fill, or crusher feed.**

Below: Crusher stockpiles at dam for filter ne. The stockpiles shown (left to right) are sand, ten-inch stone, and three-inch stone. low, Right: Dam progress from right bank, vation 2760 on seal base. To the extreme t are upstream filters, the dark portion to the t is impervious fill, three-inch stone is on the slope in the middle and to the right is -inch stone under hose.

Garbage Ala Carte



Raising hogs made easier by Pico Feeding Co.'s use of Dozer-Shovel.

WHAT WAS FORMERLY a dirty, tiresome job — cleaning up the feeding areas and the pens where 2200 hogs are fed on 40 to 50 tons of garbage per day—is now an easy one since the Pico Feeding Co. has added a Bucyrus-Erie Dozer-Shovel for this work. The Dozer-Shovel, mounted on an International TD-6 TracTracTor also releases three men for other work.

Garbage, hauled to the feeding pens on the Rio Hondo River, between the towns of Whitter and Montebello, from neighboring cities is dumped on a cement strip about ten feet wide and the hogs are turned loose on the garbage at night. The hogs feed on the garbage all night long and in the morning there is a mess of uneaten garbage and manure which is valuable fertilizer for nearby citrus groves. The Dozer-Shovel comes in handy in picking up this left-over refuse and loading it into trucks which haul it to the orchards.

The Dozer-Shovel first bulldozes the manure to the end of the concrete strip where in one or two places a concrete wall has been erected as a backstop for bucking against to facilitate loading of the Dozer-Shovel. It would be difficult to load this sticky material when the pile got small and was unsupported.

• Above: One-half cu. yd. bucket of Bucyrus-Erie Dozer-Shovel on International TD-6 TracTracTor is used to bulldoze the manure to the end of the concrete strip where (Below) a concrete wall backstop facilitates filling the bucket for loading to trucks.

Skimming an inch or so of manure without digging into the earth underneath.

Precisionbilt LIKE A BALANCE SCALE

J&L WIRE ROPE

PERMASET PRE-FORMED

Precisionbilt, like a balance scale, J&L Permaset Pre-formed Wire Rope is designed for balance and built for quality by men of experience and skill.

J&L Precisionbilt Permaset Pre-formed Wire Rope is made of J&L Controlled Quality steel—it has the strength and stamina for the toughest jobs.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

Shots from the FIRING LINE

Roads Not Affected By Steelman Directive

An official statement by the Public Roads Administration says the federal-aid highway program will not be appreciably affected by the Steelman order declaring a moratorium on federal construction. PRA has advised the state highway departments that the order contains no direct reference to highways and will not affect projects where commitments have been made. Any project which has been programmed with PRA, regardless of its status, is considered as a commitment and will be permitted to go ahead. The exact status of projects not programmed was not made clear, but it is understood that considerably more work is already programmed than will be possible to get under way this year.

PRA reiterates its policy of disapproving projects exceeding fifty per cent of 1940 prices, and has informed the state highway departments that this criteria will be more closely adhered to in the future. Also PRA has advised the state highway departments that projects involving structural steel should be wholly eliminated.

Calling attention to the fact that the Steelman order in no way affects the preparation of surveys and plans, PRA urged the highway departments to make every effort to expedite advance planning.

Rush Access Highways to Help Lumber Shortage

Immediate highway construction of access roads to standing timber in national forests and Indian reservations will go far in providing the lumber necessary to relieve the stringent housing situation, Charles M. Upham, engineer-director of the American Road Builders' Association, declared.

"Work will be started at once on 213 projects in thirty-one states and will provide 1,417.6 miles of new roads and improvements on 490.6 miles of existing roads in national forests, and eight projects providing 222 miles in Indian reservations," continues the Upham statement. "Among the states having the largest mileage are Montana with 249.4 miles, Idaho with 240.5 miles, California 107 miles, Colorado 103.7 miles and Washington 102 miles."

Funds for building these roads are allotted out of the $15 million made available for this purpose under Section C of the Veterans' Emergency Housing Act of 1946, which supplements funds in the regular appropriation to the Forest Service, explained the Road Builders' executive. Estimates place the new lumber cut in 1946 at 173 million board feet, 952 million feet in 1947 and 1,173,000,000 feet in 1948. This is from the national forests, with the Indian lands providing an additional 87 million board feet this year.

ARBA Convention Set For Feb. 17 in Chicago

The forty-fourth annual convention of the American Road Builders' Association will be held in the Palmer House, Chicago, February 17-18-19-20, 1947, James J. Skelley, president, has announced. He predicts that in attendance, interest and volume of pressing problems to be considered, this will be the most important meeting ARBA has ever held.

"All divisions of the association are vitally concerned with matters that will receive attention," said Mr. Skelley. "Our manufacturers and contractors will want to know how to expedite the postwar construction program. The educational division has been action in veterans' training. The findings of the technical committee group will have valuable information for all members. All along the line ARBA has been moving forward, and the convention will be the climax of a busy and eventful year in our annals."

Work has already been begun in selecting outstanding speakers representing engineering, industry, business and education in order to provide a program of maximum value. "Five and a half months preparation is not too long for a job of this importance," Mr. Skelly adds.

• **Limestone being loaded by Bucyrus-Erie 2½ cu. yd. shovel in Racine, Wis. quarry of Consumers Company, Chicago. Trucks haul stone to crusher and washing plant in pit. Material is blasted previous to loading.**

Utah-Winston Low on Columbia Canal Bid

Utah Construction Co., Salt Lake City, and Winston Brothers Co., Minneapolis, were joint low bidders at $3,997,136.75 for constructing the first 12.3 miles of the 130 mile East Low Canal for the Bureau of Reclamation's million-acre Columbia Basin Project in south-central Washington. Seven construction firms submitted four bids for the canal work near Adrian, Grant County.

The bid call was in two schedules. Totals bid by the other firms, as announced by Supervising Engineer Frank A. Banks, were:

J. A. Terteling & Sons, Boise, $4,061,706; Guy F. Atkinson Co., Portland, Ore., W. E. Kier Construction Co., Los Angeles, and Bressi & Bevanda Constructors, Inc., Los Angeles, $4,324,345.50; Morrison-Knudsen Co., Inc., Seattle, $4,588,423.

The Bureau of Reclamation now has opened bids on three of the Columbia Basin Project irrigation system's four large earth-and-rock fill dams, totaling nearly six miles in length; on the 20-mile Main Canal, and its 10,000-foot Bacon Tunnel and 1,000-foot Bacon Siphon, each big enough to hold a railroad boxcar; on a temporary pumping plant and 23 miles of irrigation laterals near Pasco, at the southern end of the project; and on the first 6.6-mile section of the 80-mile West Canal.

The East Low Canal will carry Columbia River water to 252,000 acres of dry land in the East Columbia and South Columbia Basin Irrigation Districts, and the northeastern corner of the Quincy-Columbia Basin Irrigation District. It ultimately will extend the length of the project, terminating in the Snake River Valley, eight miles northeast of Pasco. The canal will have a capacity of 4,500 cubic feet of water per second.

One schedule in the latest bid covers construction of the East Low Canal from its juncture with the Main Canal, two and one-half miles north of Adrian,

Thermoid – For Progress in Industry

The makers of the Beltloder have standardized on Thermoid belting for many years because it has proven itself capable of standing up under hard punishment. Exposure to weather, high angle of operation, intermittent loads, various kinds of materials all put the Beltloder and its Thermoid belting to an extreme test. The toughness and super-flexibility of Thermoid belting permits the use of a very small idler pulley on the Beltloder, making it possible to bring the belt closer to the ground and with less difficulty to push the conveyor into the pile of material to be moved.

This is just one of hundreds of instances of the way Thermoid—working with designers, engineers and production men—has aided industrial progress. Whatever your problem in the field of materials handling or power transmission, you owe it to yourself to consult your Thermoid Representative. Like so many others, you may find—It's Good Business to Do Business with Thermoid.

THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.

Loading coal the costly, old-fashioned, back-breaking way.

★ ★ ★

Fast, economical coal-loading with the Thermoid-equipped Beltloder. On this rigorous job, users estimate that a single Thermoid conveyor belt handles as much as 100 thousand tons of coal.

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This New Onan

FLOODLIGHTER

Solves your lighting problems!

High-speed mobility
•
Quick electric starting
•
Simple operation
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Dependable large-area lighting

NIGHT OPERATIONS are easier, faster, safer . . . with the mobile Onan Floodlighter. Special dolly mounting permits quick hitching and high-speed towing. On location, the Floodlighter is easily moved, operated and serviced by one man.

Three 1000-watt lamps, enclosed in spun aluminum reflectors, provide brilliant illumination for airport runways, loading ramps, aprons, outdoor depots and construction sites.

Rugged, weatherproof, sheet-steel housing protects the 3000-watt A.C. power plant. The prime mover is an Onan air-cooled gasoline engine direct connected to the generator for maximum compactness and permanent alignment. Quick and sure push-button electric starting.

Motor-driven tools and auxiliary lights plug-in directly at the four outlets mounted on a recessed panel.

Standard Equipment

FLOODLIGHTS: Three; height adjustable to 8½ feet; 360 degree horizontal arc; wide vertical arc.

ENGINE: Onan 2-cylinder, 4-cycle, air-cooled.

GENERATOR: 4-pole, self-excited, inherently regulated.

DOLLY MOUNTING: Two ball-bearing steel-disc wheels; 6 x 15, four-ply pneumatic tires; ball trailer hitch; deadstands.

STARTING: Electric push-button; batteries supplied.

•

ONAN Electric Plants are available in many sizes and models.

ALTERNATING CURRENT: 350 to 35,000 watts in all standard voltages and frequencies.

DIRECT CURRENT: 600 to 10,000 watts, 115 and 230 volts.

BATTERY CHARGERS: 500 to 3,500 watts; 6, 12, 24 and 32 volts.

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ELECTRIC PLANTS

Write for detailed information

to a point approximately midway between Adrian and Wheeler. It includes earthworks, concrete lining, turnouts for diverting water into farm feeder canals, drain inlets, culverts, and four bridges at points where the canal will cross county roads.

The second schedule involves construction of three reinforced-concrete siphons, each 20 feet in diameter; two checks for controlling water flow; and one turnout. A 3,300-foot siphon will carry water across the Crab Creek channel and beneath Primary State Highway No. 7, north of Adrian. A 1,400-foot siphon will cross the channel and pass under the Great Northern Railroad, also north of Adrian. The third siphon, 1,800 feet long, will carry water over a ravine, one and one-half miles south of the Moses Lake-Stratford road.

American Firms Get Venezuelan Jobs

Two American firms, Smith Engineering Contracting Co., and Stevens Co., Associated, were awarded contract to lengthen and reinforce 500 meters of breakwater on the northern side of the port of LaGuayra. The project, which will take 15 months to complete, will cost $4,500,000. Only two other bids were received, both American firms.

The government of Venezuela has also contracted with the Stevens Company of Venezuela, a branch of the New Orleans firm, to dredge an additional 10 meters at the port of LaGuayra, to dredge the Puerto Cabello port, as well as drain and fill in the ground and construct two runways for an airport at Higuerote. To do the work in Venezuela, the Stevens company is moving in considerable of its dredging equipment from New Orleans. Work is expected to start late in September under direction of E. E. Elam, operations manager for the company in Venezuela.

Blast-Furnace Slag in 1945

In 1945, output of commercialized blast-furnace slag totaled 12,635,868 tons, two percent more than the 12,405,992 tons reported in 1944. Sales of air-cooled slag increased three percent. These statistics are based on a canvass, conducted by the National Slag Association, of the 32 companies that prepared blast-furnace slag for commercial use. The results of this canvass were assembled in cooperation with the Bureau of Mines, United States Department of the Interior.

Practically all of the commercial production is east of the Mississippi River, chiefly at steel centers located in Ohio, Alabama, Pennsylvania, and Illinois. Shipments, however, are made into all States east of the Mississippi except some of the New England States outside the economic range of sources of supply.

The average shipping range of blast-furnace slag in 1945 was 63 miles by rail, 15 by truck, and 125 by waterway. In most instances shipments did not exceed 100 miles by railroad, 30 by truck, and 250 by waterway.

RODGERS SHOP PRESSES

The improved Rodgers Heavy Duty Shop Presses are designed to handle those 101 tough pressing, squeezing and forcing jobs you run up against so often. Both the 100 and 150 ton models offer a versatility of use not found in any other tool.

Rodgers Shop Presses have a moveable bolster which is simply raised or lowered by a crank and positioned by pins in the frame. The cylinder is adjustable across the entire frame width and may be mounted inside the top frame or suspended below it. Open sides of the frame allow long pieces to extend beyond width of the press. Construction is of rolled steel plate. Power is supplied by the Rodgers 4-speed Hand Pump conveniently mounted on the side. A Rodgers Power Pump Unit is available when desired.

You will save time, labor and trouble with a Rodgers Shop Press — write for details.

SPECIFICATIONS

100 TON SHOP PRESS

Model No. 108A	Bolster Opening		
Specifications	Standard	18"	24"
Overall Height—6½" Ram Travel	85½"	85½"	85½"
Overall Height—13" Ram Travel	94⅜"	94⅜"	94⅜"
Floor Space — Base	44"x63⅜"	44"x63⅜"	44"x63⅜"
Hoist Extends Beyond Base	9"	9"	9"
Pump Handle Extends Beyond Base	1¾"	4½"	7½"
Width Between Side Members	45"	45"	45"
Depth Between Side Members	8½"	14"	20"
Depth Between Bolsters (Work Table)	12½"	18"	24"
Maximum Daylight	35"	35½"	35½"
Minimum Daylight	7"	7½"	7½"

150 TON SHOP PRESS

Model No. 109A	Bolster Opening		
Specifications	Standard	18"	24"
Overall Height—7½" Ram Travel	89"	89"	89"
Overall Height—13" Ram Travel	97¼"	97¼"	97¼"
Floor Space — Base	44"x70½"	44"x70½"	44"x70½"
Hoist Extends Beyond Base	9"	9"	9"
Pump Handle Extends Beyond Base	1¾"	4½"	7½"
Width Between Side Members	48"	48"	48"
Depth Between Side Members	8½"	14"	20"
Depth Between Bolsters (Work Table)	12½"	18"	24"
Maximum Daylight	35½"	35"	35"
Minimum Daylight	7½"	7"	7"

Matched set of "V" blocks are included as standard equipment for both 100 and 150 ton presses.

The new Rodgers "Sixty"—60 ton Shop Press has the same features as the larger models—ideal for hundreds of uses. Write for literature.

Rodgers Hydraulic, Inc.

HYDRAULIC POWER EQUIPMENT

Shop Presses

Crawler-Track Presses

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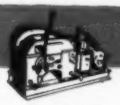
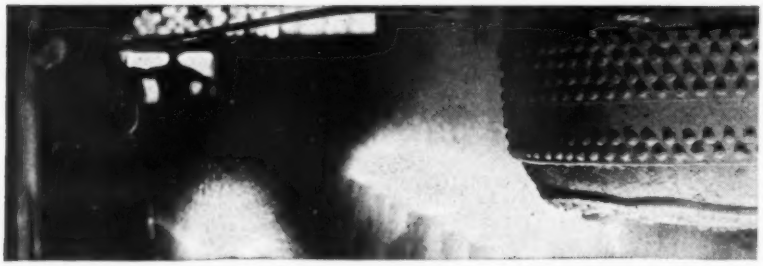
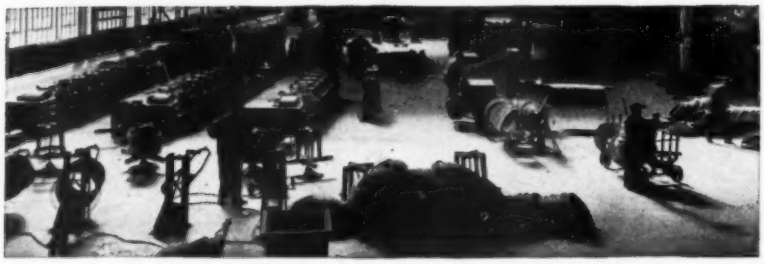

Power Pump Units

Portable Presses

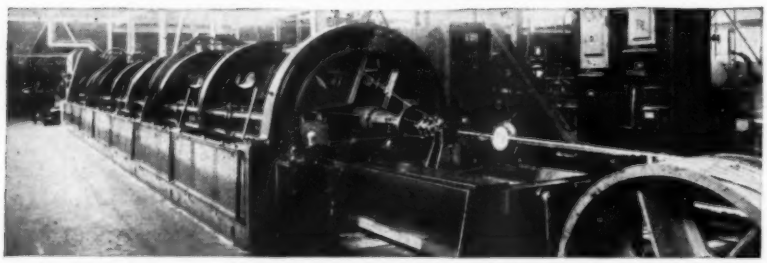
FROM THE MAKING OF THE STEEL—



THROUGH PROCESSING THE WIRE—



TO FABRICATING THE WIRE ROPE—



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is safeguarded by continued, careful control to assure the utmost in performance, safety and long life. Wickwire Spencer Wire Rope is available in all sizes and constructions—both regular lay and WISSCOLAY *Pre*formed.

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Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts. For your FREE copy, write

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An outstanding development is the increase in production of lightweight slag for use in building construction. To service the seemingly insatiable demand for building materials in the latter part of 1945, installation of concrete block plants reached a record rate. As they began to operate, demand for lightweight aggregates grew in proportion. Tests and experience both in this country and in Europe indicate that expanded slag is particularly valuable for this use. Most foamed slag is produced with Brosius and Caldwell machines in the United States, but other methods are under investigation also.

In 1945, slag processors reported that 158,186 tons of iron were recovered—approximately 24 pounds per ton of slag handled.

Not including those assigned to administrative, office, and sales activities 1,414 plant and yard employees were engaged in the production of commercial slag in 1945.

Set Earth-Placing Record At Anderson Ranch

Earth-placing production at Anderson Ranch Dam of the Boise Project in southwestern Idaho reached a record high in August with 411,709 cu. yds. of material added to the structure, Donald S. Walter, Construction Engineer for the Bureau of Reclamation, reported.

The previous high was 370,606 cu. yds., placed in October 1945. The dam, situated on the South Fork of the Boise River, ultimately will contain 9,053,300 cu. yds. of material.

"Although construction activities on other features of the project have been curtailed to a large extent because of reduced appropriations for fiscal year 1947, excellent progress is being made on the project," Walter said.

The structure, which when completed will be the highest earth-fill dam in the world, now contains 7,414,486 cu. yds. of material, leaving 1,638,814 cu. yds. remaining to be placed.

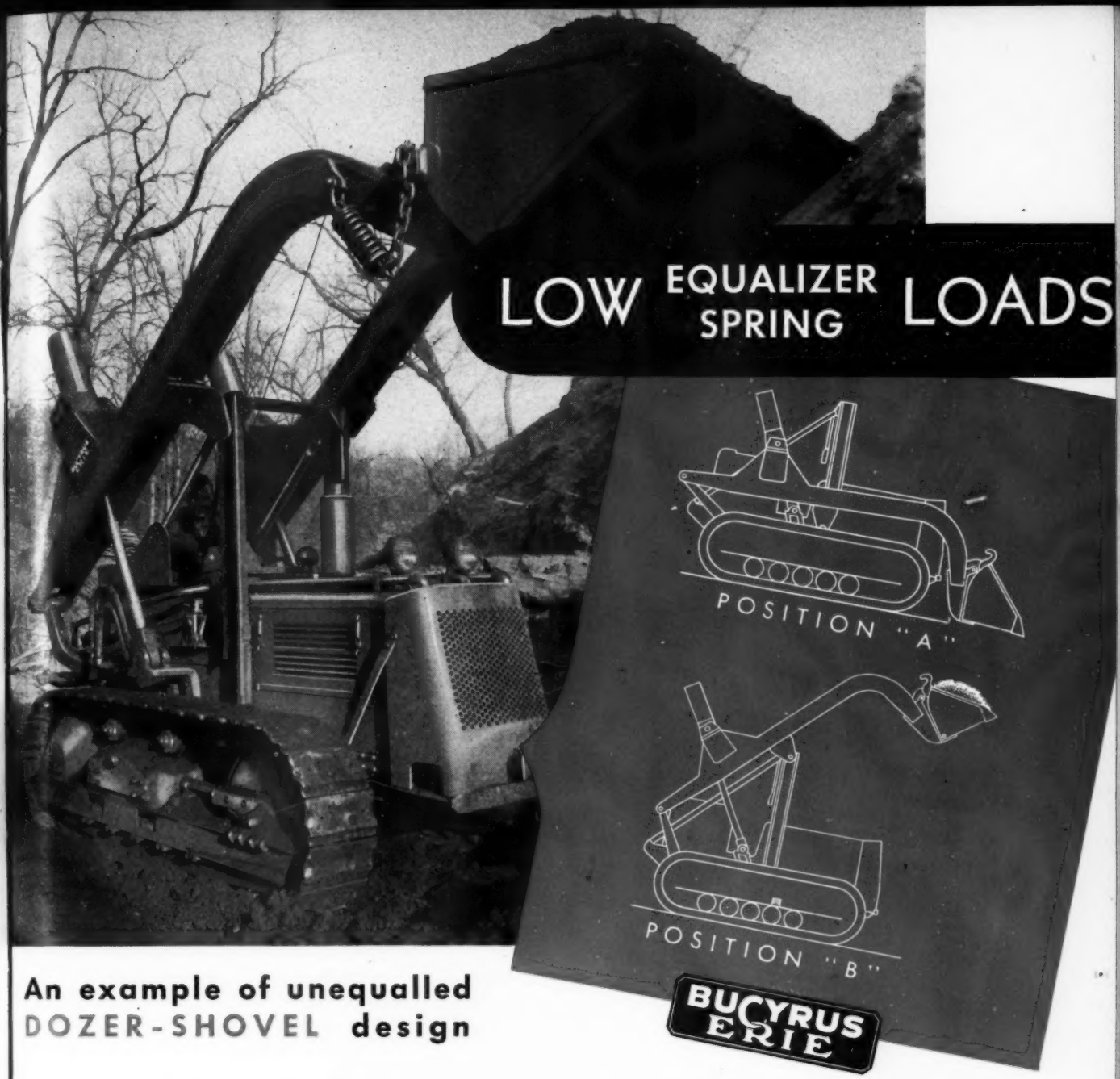
The dam, exclusive of the outlet works, spillway, and powerhouse, is approximately 84 percent complete. Provided adequate funds are made available it will be completed in 1948.

Anderson Ranch Dam provided initial storage of supplemental water for the 320,000-acre Boise Project during the past irrigation season. Eighty thousand acre-feet were made available. Present plans call for storage of 130,000 acre-feet of water for the 1947 irrigation season, 340,000 acre-feet for 1948, and full storage — approximately 500,000 acre-feet—for the 1949 season.

Reclamation Bureau Awards 109 Million in Contracts

Contracts amounting to more than 109 million dollars were awarded by the Bureau of Reclamation in the fiscal year ended June 30, 1946, according to a report made by Commissioner of Reclamation Michael W. Straus to Secretary of the Interior J. A. Krug.

(Continued on page 562)



An example of unequalled DOZER-SHOVEL design

All the inherent operating characteristics of International TracTracTors are retained when Bucyrus-Erie DOZER-SHOVELS are mounted on them.

Take the matter of TracTracTor equalizer-spring loads, for instance—it offers a typical example. Because of the DOZER-SHOVEL'S unique design by which forces balance and offset each other, equalizer-spring loads are never excessive, regardless of the position of the shovel bucket. Look at the illustrations given here: In position "A," when starting to lift the bucket, the guide rollers in the lift arm guides press forward against the front rail, tending to increase the load on the spring, but at the same time a balancing force is set up in the rocker arms which tends to reduce the load on the spring. In "B," both these tendencies are reversed. In all positions, these tendencies offset each other, with the result that the DOZER-SHOVEL attachment imposes no excessive weights on the TracTracTor equalizer spring. This is an exclusive Bucyrus-Erie feature! In a DOZER-SHOVEL and TracTracTor combination you have an earthmoving tool that converts full tractor speed, power, and flexibility into outstanding digging, loading, bulldozing, and lifting service. Ask your International TracTracTor distributor about such important features as oscillating tracks, exceptional versatility, full front visibility, low clearance, positive down pressure — all big contributors to big output. BUCYRUS-ERIE COMPANY, South Milwaukee, Wis.

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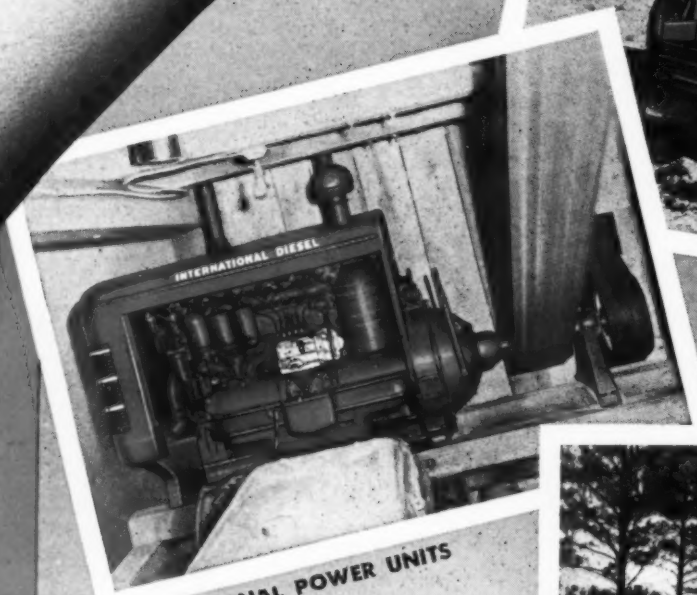

INTERNATIONAL POWER UNITS

INTERNATIONAL WHEEL TRACTORS

The TD-18 Diesel Crawler with bullgrader, clearing and grading a new highway right-of-way in the upper illustration, is one of four International Diesel models currently available. Several additional models will soon be announced.

The UD-18 Diesel Power Unit in the photograph immediately above is the largest of four International Diesel power plants currently available. In addition there are four carbureted models. Several new Diesels will soon be in production.

The ID-9 Diesel Wheel Tractor hauling the wobble-wheel road compactor, at right, is one of two Diesel and four carbureted International industrial wheel tractors currently available through distributors.

Product of INTERNATIONAL HARVESTER

This symbol, emblazoned on current models of International Industrial Tractors, Engines and Power Units, is your assurance of dependable products, sold and serviced by soundly financed and reputable distributors—and backed by the reputation, resources and facilities of the International Harvester Company.

It marks the establishments set up to serve you most efficiently. It marks the manufacturing works that produce these outstanding tractors and engines.

And when the *new* crawlers, wheel tractors and power units, soon to be offered, have satisfied all engineering requirements and passed exhaustive field tests, this symbol will be found upon their radiator grilles in bold relief.

Look for this symbol when you buy power for earthmoving and construction equipment. It is your guarantee that the product bearing it meets all the exacting requirements and specifications that make International Industrial Power products outstanding.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

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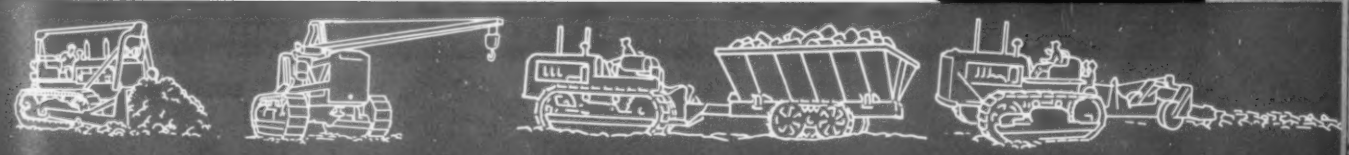
INTERNATIONAL *Industrial Power*



DIESEL'S THE POWER that converts *low-cost* fuel into harnessed energy with the highest degree of efficiency known to internal combustion engines. Diesel Power has no electrical ignition or carburetor to require constant cleaning and adjustment. Diesel fuel is safe to store . . . Diesel fumes are harmless. With a minimum of attention, only a Diesel will give a maximum of dependable day-after-day service.

Sheppards' **THE DIESEL** that has been simplified to the greatest degree by advanced Diesel engineering. It is delivered complete, ready to operate . . . there's nothing extra to buy. A Sheppard Diesel is rated by its *actual* continuous H.P. delivery while operating fully equipped . . . not on the *measured* performance of the *bare* engine. And, only a Sheppard Diesel is equipped with the exclusive, simplified Sheppard fuel injection system that obtains every last push of power from every drop of low-cost domestic furnace oil. Write for new 16-page Sheppard Diesel booklet.

Power Units
3¾ to 56 continuous H.P., operating fully equipped

Generating Sets
2,000 to 36,000 watts

R. H. SHEPPARD COMPANY, INC., 34 Middle St., Hanover, Pa.

Shots from the Firing Line

(Continued from page 558)

This record reclamation figure was largely attained in the past six months and reflected the post-war resumption of natural resource development after a drastic curtailment during the war years, Commissioner Straus reported. As part of the reconversion program it further reflects an effort to meet the tremendous demand of returning service men for a firm place in the nation's economy on irrigated acres, he declared. This demand far exceeds the available supply.

Although the irrigation and multiple-purpose projects of the Bureau of Reclamation are located in the 17 Western States, contracts for both equipment and construction work are awarded on a competitive basis to private industries all over the country.

All of these contracts, Mr. Straus pointed out, were awarded prior to the letter of August 2 from the President, and the subsequent directive from the Office of War Mobilization and Reconversion, placing a moratorium on new Federal public works until October 1, 1946. In accordance also with the President's letter, construction projects of the Bureau of Reclamation will be limited during the fiscal years 1947 and 1948.

Of the $109,000,000 total of Bureau of Reclamation contracts for the last fiscal year, more than $55,000,000 in over 200 contracts were awarded in June, the Commissioner said. The figures rose to that amount by virtue of three contracts that ran more than $5,000,000 each, two that were in excess of $4,000,000, three that were in excess of $3,000,000, and two that amounted to more than $2,000,000 each. Altogether, 13 contracts awarded in June totaled more than a million dollars each.

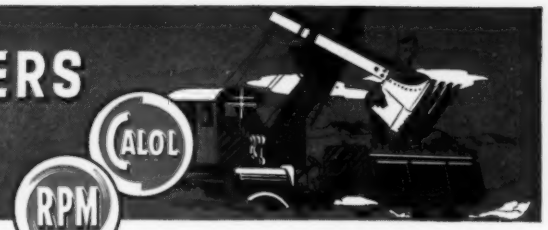
In contrast, the total contract awards in July 1946, amounted to only $2,948,600.

The largest single contract awarded in June was for $5,988,969—for the Granby Dam and dikes on the Colorado River, about 50 miles northwest of Denver on the western slope of the Rocky Mountains. The dam is part of the Bureau of Reclamation's Colorado-Big Thompson project. The contract went to the Granby Constructors of Denver, a joint company made up of seven construction companies located in Nebraska, Texas, Missouri and Colorado. The Granby Constructors were the lowest of three bidders.

Commissioner Straus regards the Colorado-Big Thompson project, from an engineering standpoint, as one of the most spectacular the Bureau has yet undertaken. It is designed to divert surplus water from the western slope of the Rocky Mountains through a 13-mile tunnel under the Continental Divide, to the established agricultural area that needs the supplemental supply.

The largest construction feature that was placed under contract during June was the Horsetooth Reservoir on the

STANDARD ENGINEERS NOTEBOOK



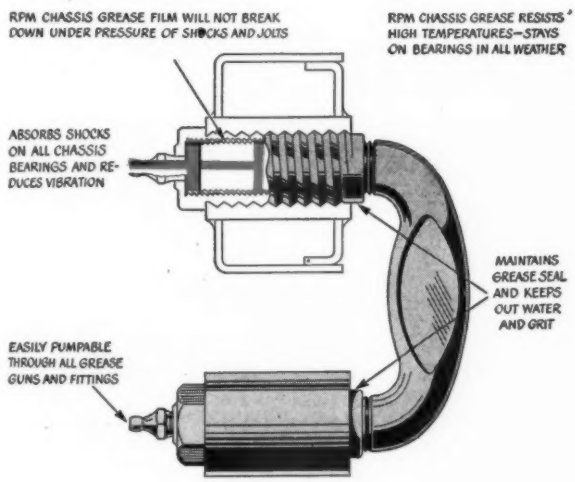
Shock-absorbing grease reduces shackle wear

Because it contains a special stringiness agent that keeps a tenacious lubricant film on shackle and other chassis bearings, RPM Chassis Grease will eliminate squeaks and cut wear to a minimum.

Besides using it on chassis bearings, many truck and bus operators lubricate heavy-duty tractor fifth-wheel bearing surfaces with RPM chassis Grease.

The tough lubricant film acts like a cushion. It absorbs countless shocks imposed on bearings and will not rupture even under an overload. This unusual ability also reduces vibration and makes vehicles ride smoother.

Highly resistant to heat and moisture, RPM Chassis Grease seals out water and grit on and at the edges of bearings. It may be applied easily in cold weather and protects vital wear-points in summer.


RPM CHASSIS GREASE FILM WILL NOT BREAK DOWN UNDER PRESSURE OF SHOCKS AND JOLTS
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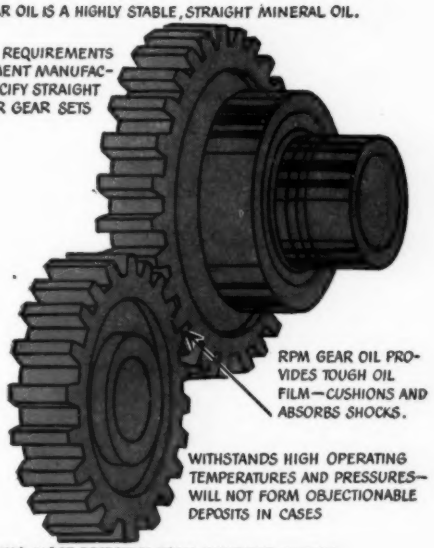
ABSORBS SHOCKS ON ALL CHASSIS BEARINGS AND REDUCES VIBRATION
MAINTAINS GREASE SEAL AND KEEPS OUT WATER AND GRIT
EASILY PUMPABLE THROUGH ALL GREASE GUNS AND FITTINGS

U-TYPE SPRING SHACKLE

RPM GEAR OIL IS A HIGHLY STABLE, STRAIGHT MINERAL OIL.


MEETS GENERAL REQUIREMENTS OF GEAR EQUIPMENT MANUFACTURERS WHO SPECIFY STRAIGHT MINERAL OIL FOR GEAR SETS
RPM GEAR OIL PROVIDES TOUGH OIL FILM—CUSHIONS AND ABSORBS SHOCKS.
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RPM Gear Oil deposits a tough lubricant film on gear teeth and bearings that prevents metal-to-metal contact in all operating conditions. It cools the surfaces and carries away heat. It extends gear and bearing life.

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RPM Gear Oil is made in three viscosity grades: SAE 90, 140, and 250. One of these grades will flow freely over gears and their bearings in every atmospheric temperature condition.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Col.; Standard Oil Company of Texas, El Paso, Texas.

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

Colorado-Big Thompson project. It will extend approximately five miles south from a point four miles west of Fort Collins, Colorado. Two contracts were awarded for the work in the total amount of $9,431,304. One contract covering the construction of the Horsetooth Dam and Satanka Dike and Soldier Canyon Dam was awarded to a joint venture composed of the Grafe-Callahan Construction Company, Gunther and Shirley Company, and W. K. McIlyar, for $5,111,877. A contract covering the construction of the Dixon Canyon Dam and the Spring Canyon Dam was awarded to a joint venture composed of the Hinman Brothers Construction Company, and the partnership of Rhoades Brothers and Shofner for $4,319,427.

The third largest single contract in June—$5,079,976—was awarded to the Arizona-Nevada Constructors of Phoenix, Arizona, a joint venture composed of six companies and individuals in Minnesota and Arizona, for the construction of 29 miles of the Friant-Kern Canal on the Bureau's 2,100,000-acre Central Valley project in California. A companion contract, for $3,344,432, for 13.2 miles of the same canal, the wasteway and a siphon, went to Morrison-Knudsen Company, Inc., and M. H. Hasler, joint bidders, of Los Angeles.

By virtue of a $21,462,505 contract—largest single contract awarded by the Bureau in the fiscal year—January became the second biggest month in Bureau of Reclamation contract awards during the 1946 fiscal year, the month's total exceeding 23 million dollars. This contract was for the construction of Davis Dam, the fourth major structure designed by the Bureau of Reclamation for the regulation of the Colorado River. The award went to the Utah Construction Company of San Francisco, the lowest of four bidders.

The dam, located in Pyramid Canyon, 35 miles west of Kingman, Arizona, is the largest construction project undertaken by the Bureau in the Southwest since it built Boulder Dam, 64 miles upstream. Davis Dam will be an earth and rock-fill structure 138 feet high and 1,600 feet long at the top. It will create a reservoir with a capacity of 1,820,000 acre-feet of water.

This multiple-purpose project will provide storage water for irrigation and domestic use within the United States and for delivery at the United States-Mexico international boundary as provided by the Mexican water treaty.

While Davis Dam is under construction, the entire flow of the Colorado River will be diverted around the Arizona abutment in an open diversion channel, which later will be used to supply water to the power plant and to discharge flood, irrigation and other flows.

April, with contracts totaling in excess of 10 million dollars, was the third largest month in awards. The other months during the present calendar year followed in this order: March, awards in excess of six million; February, in excess of four million, and May, over three million.

The awards during the first six months of the fiscal year, July to December, 1945, inclusive, totaled more than four million dollars.

Drake-Utah-Grove Given Philippine Contract

The U. S. Engineers awarded a large C. P. F. F. contract for all their construction in the Philippine Islands to Johnson, Drake and Piper, Inc., of Minneapolis, Minnesota, New York City and Oakland, California; The Utah Construction Company of Ogden, and Salt Lake City, Utah, and San Francisco, California; and Grove Shepherd Wilson and Kruge, Inc., of New York City, Washington, D. C., and St. Louis, Missouri.

These three well-known national firms have had wide experience on Army and Navy construction, both in the United States and abroad, and cover the entire United States in their various operations. They will operate as a joint venture—known for convenience as Drake-Utah-Grove.

Mr. Edgar White, formerly of The Utah Construction Company, has been selected as general manager, and Russell Ellingsen has been selected as United States manager.

United States headquarters have already been established at Sausalito, a suburb of San Francisco and foreign headquarters have been established in

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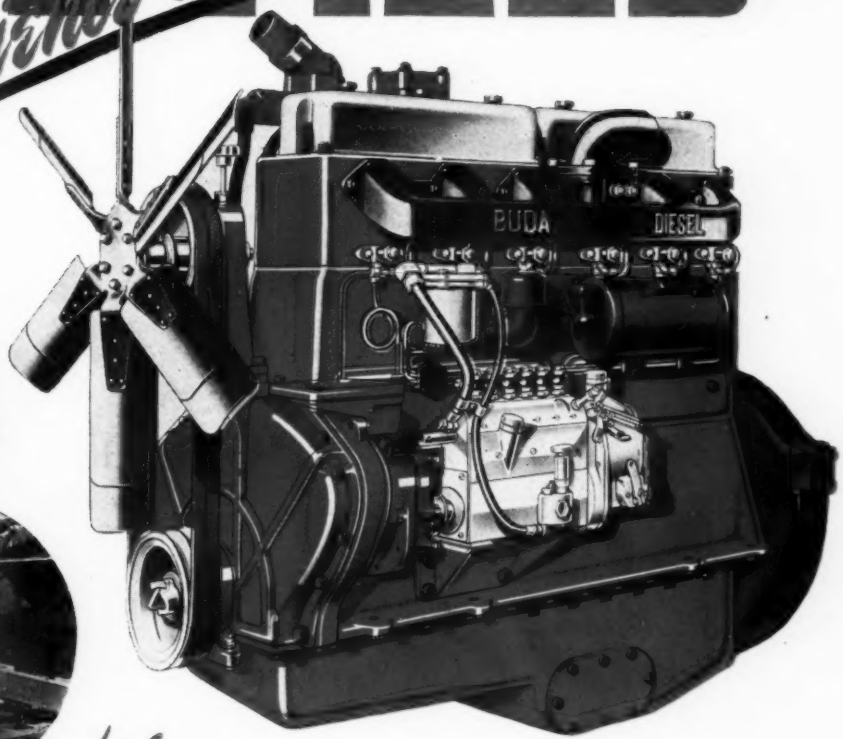

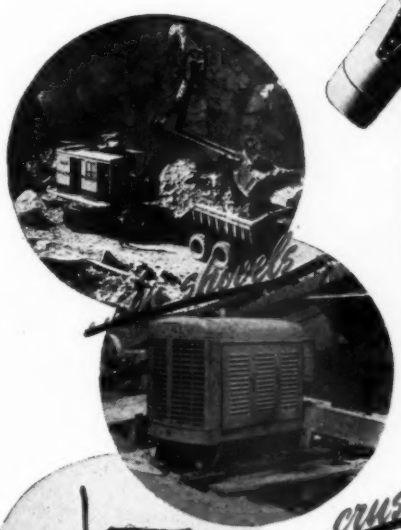

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...crushers

...earth moving

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the Marsman Building in Manila.

The work is very extensive in scope (the initial contract being in excess of $30,000,000) and is expected to continue for several years. In general, the work is to consist of the erection of permanent facilities to replace certain of the Army's temporary T.O. type construction.

The work will be under the general direction of Lieutenant General R. A. Wheeler, Chief of Engineers in Washington, D. C. and will be administered by Brigadier General J. S. Bragdon, in charge of all Army military construction. This specific contract as well as others in the Western Pacific will be supervised by Brigadier General L. D. Worsham, Division Engineer, Western Ocean Division, who has established his Division Headquarters, together with his contractors and architect-engineers in buildings formerly occupied by the Marinship Corp. at Sausalito, California. The Philippine work will be under the immediate direction of District Engineer Colonel Clarence Renshaw, with headquarters in Manila.

Mr. Edgar White, General Manager, and Philip Grove and Robert Bayard, members of the executive committee of the joint venture, have returned from a four-week reconnaissance trip by air covering all their Philippine work. They report that the wreckage of Manila is beyond belief and that they were deeply impressed with the tremendous task of rehabilitation which faces the Filipinos as their first task after securing their independence.

Home Building Volume Declines 16 Per Cent

The effect of inadequate home building materials and supplies, and in some areas shortages of building craftsmen, was reflected in a 16 percent drop in contracts awarded for residential construction in the 37 states east of the Rocky Mountains in July, it was reported by F. W. Dodge Corporation, a fact-finding organization for the construction industry.

July residential contracts totaled $281,227,000 compared with $332,248,000 in June, and brought the total for the first seven months of this year to $1,914,700,000. During the corresponding seven months of last year residential contracts totaled $243,782,000 in the states east of the Rockies.

Public housing contracts were an important part of the July volume, with $31,917,000 or 11 percent of the total of all residential contracts being listed as publicly owned. Home builders believe that one factor in this sizable volume of publicly owned housing may be attributable to the top priorities given to public housing as compared with priorities issued for privately owned home construction, the Dodge corporation reported.

While home building contract volume was receding, nonresidential construction contracts showed a modest gain from $273,207,000 in June to $283,635,000 in July. Commercial, educational, science, hospital and institutional building volume showed gains. Manufacturing building contracts declined but still represented the most active kind of nonresidential building investment, with a July total of $129,302,000.

The Dodge Corporation reported that 28 percent of all construction contracts in July was listed as publicly owned, and that 21 percent of the total for the first seven months of the year was awarded by various municipal, state and federal agencies.

Oregon Financially Sound For Postwar Road Program

Placing Oregon in a sound financial position to carry out its postwar highway construction plans, bonds of the Oregon State Highway Commission have been reduced to $4,000,000, with indications that within a few years the commission will be on a pay-as-you-go basis. This was announced by Gov. Earl Snell, who pointed out that the state's highway debt had been halved in the last three years.

"We are confidently looking forward to a tremendously expanded program of building, reconstruction and development," the governor said, adding that the Oregon Highway Commission is in the best financial condition in its history with postwar construction con-

(*Continued on page 570*)

SERVING THE CONSTRUCTION INDUSTRY SINCE 1872

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For three quarters of a century, OSGOOD has designed and built equipment for the construction industry, pioneering improvements that have long since become standard. Today, the experience and know-how gained through 75 years of manufacturing dependable, economical-to-operate machines is reflected in this, the newest OSGOOD unit. Here is ample power for the toughest job, ease of operation that means more work per day, economy of operation that means more profit per job. Watch for the OSGOOD Type 100 . . . plan now to enjoy the advantages that only an OSGOOD provides.

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There are 4 Timken Bearings in the front wheels, 4 in the steering gear, 2 in the side shift case, 4 in the transfer drive case, 2 in the transmission case and 8 in the tandem drive cases. They assure smooth operation, simplify lubrication, increase endurance, reduce maintenance.

Timken Bearing Equipped machines not only work better; they *sell better*—for Timken Roller Bearings are known and preferred the world over. Look for the trade-mark "TIMKEN" on every bearing you use and thus be sure of getting all there is in bearings. The Timken Roller Bearing Company, Canton 6, Ohio.

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No matter how or where you operate this Complete Lubrication Service can save you time all down the line!

Are equipment failures raising Cain with your work schedules . . . tying up *other* machines?

No matter how varied your equipment — we can help you minimize breakdowns . . . keep machines at peak efficiency—with exactly the right oil or grease for every application!

Having trouble finding tested maintenance schedules that fit your individual needs?

Our Representative studies your set-up — supplies you with the *right* time-saving schedules — helps your men adapt them to your special requirements to simplify maintenance.

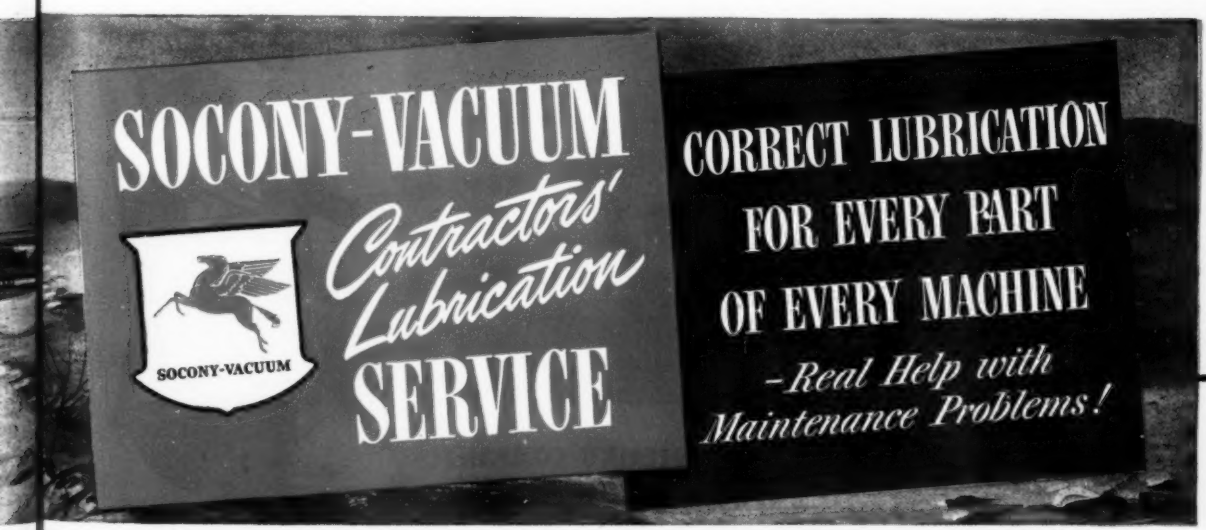
Are too-frequent interruptions for refueling and lubrication slowing up work-progress?

Wherever you're located, we'll arrange on-the-job deliveries. Result: Fewer field interruptions . . . fewer inventory problems.

Are "problem" machines causing repeated delays, turning out less and less work?

When the cause is lubrication, our Representative can give you practical help — or, when necessary, call in qualified engineering aid.

Why Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!



Shots from the Firing Line

(*Continued from page 566*)

tracts of $9,000,000 awarded since last November.

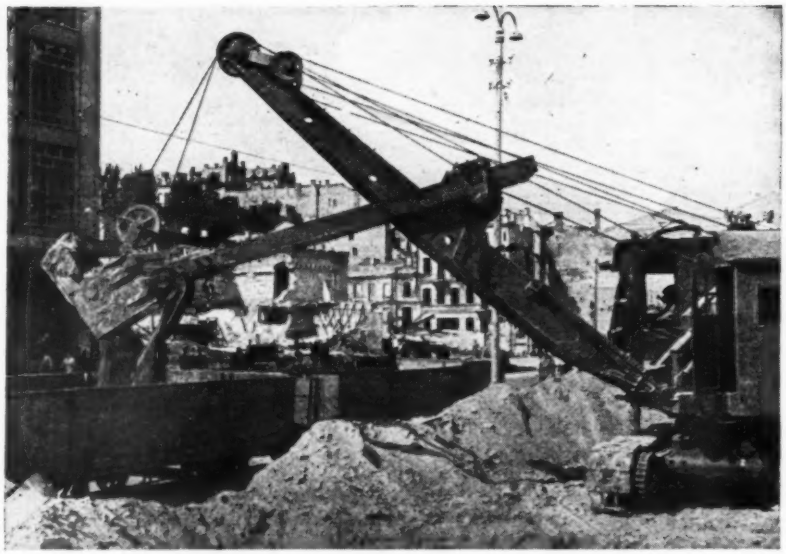
"For 28 years," he said, "we have been paying on the financing of highways. By the end of this year a total of $51,650,000 of principal will have been paid, with more than half of that amount representing interest of $29,598,000. Since the inception of the commission, $81,248,000 has been repaid to investors in principal and interest."

Governor Snell said a total of $37,000,000 is available for construction and maintenance operations during the current year, but not all this work can be done because of shortages of materials and building restrictions.

Fifteen Firms Enter Four Bids On Potholes Dam

A low bid of $9,359,011 for building the 3½-mile Potholes Dam near Warden, Wash., to impound water for irrigating 270,000 acres in the southern part of the million-acre Columbia Basin Project, was submitted by the C. F. Lytle Construction Co., Sioux City, Iowa, Green Construction Co., Des Moines, Iowa, and Amis Construction Co., Oklahoma City, Okla.

Four bids, representing 15 construction firms, were opened by Roy B. Williams, acting supervising engineer for the multi-million-dollar project of the Bureau of Reclamation in south-central Washington. Other bidders on the earth-and-rock structure, which will be the fourth longest dam in the United States, were: Bressi & Bevanda Constructors, Inc., Los Angeles, W. E. Kier Construction Co., Los Angeles, A. Teichert & Son, Sacramento, and Guy F. Atkinson Co., Portland, Ore., $9,584,677; Morrison-Knudsen Company, Inc., Seattle, Peter Kiewit Sons Co., Omaha, S. Birch & Sons Construction Co., Great Falls, Mont., McLaughlin Inc., Great Falls, Winston Brothers Company, Minneapolis, C & F Trucking & Construction Co., Butte, Mont., and Utah Construction Co., Salt Lake City, $10,448,000; and J. A. Terteling & Sons, Inc., Boise, Idaho, $11,168,479. The low bidders speci-



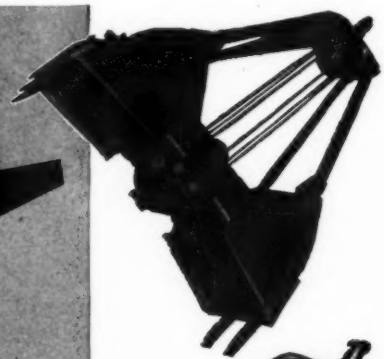
• Reconstruction work on the main street of Kiev in the Ukraine, which was completely destroyed by the Germans.

World News Services

First to feature Welded Steel Construction

WELLMAN

Williams Type BUCKETS



Bucket users know that welded steel construction means longer service at lower cost. Wellman originated this finer type of bucket construction! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service: ⅜ to 16½ yd. capacity.

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show where and how to apply hard metal for maximum life increase. Procedures are designed to eliminate unnecessary waste of hard metal yet to provide *maximum* protection against wear.

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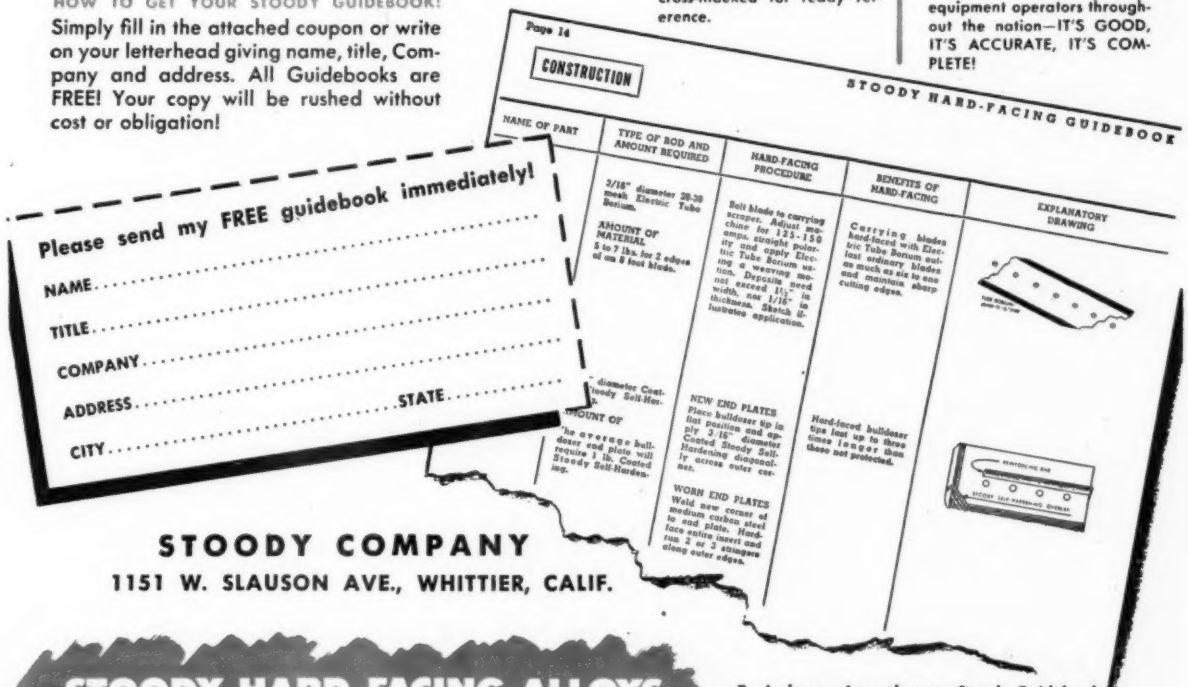
Use of the Stoody Guidebook may open your eyes to dozens of new ways to keep equipment on the job, cut overhauls and down-time and reduce expensive inventory!
It's designed to bring you the latest, most-up-to-date hard-facing methods, proved by equipment operators throughout the nation—IT'S GOOD, IT'S ACCURATE, IT'S COMPLETE!


Page 14
CONSTRUCTION
STOODY HARD-FACING GUIDEBOOK

NAME OF PART	TYPE OF ROD AND AMOUNT REQUIRED	HARD-FACING PROCEDURE	BENEFITS OF HARD-FACING	EXPLANATORY DRAWING
	3/16" diameter 28-30 mesh Electric Tube Borium. AMOUNT OF MATERIAL 5 to 7 lbs. for 2 edges of an 8 foot blade.	Bolt blade to carrying scraper. Adjust machine for 125-150 amps. straight polarity and apply Electric Tube Borium using a weaving motion. Deposits need not exceed 1½" in width, nor 1/16" in thickness. Sketch illustrates application.	Carrying blades hard-faced with Electric Tube Borium outlast ordinary blades as much as six to one and maintain sharp cutting edges.	
	diameter Coat-Stoody Self-Har-AMOUNT OF The average bull-dozer end plate will require 1 lb. Coated Stoody Self-Hardening.	NEW END PLATES Place bulldozer tip in flat position and apply 2-16" diameter Coated Stoody Self-Hardening diagonally across outer corner. WORN END PLATES Weld new corner of medium carbon steel to end plate. Hard-face entire insert and run 2 or 3 stringers along outer edges.	Hard-faced bulldozer tips last up to three times longer than those not protected.	

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STOODY HARD-FACING ALLOYS
Retard Wear — Save Repair

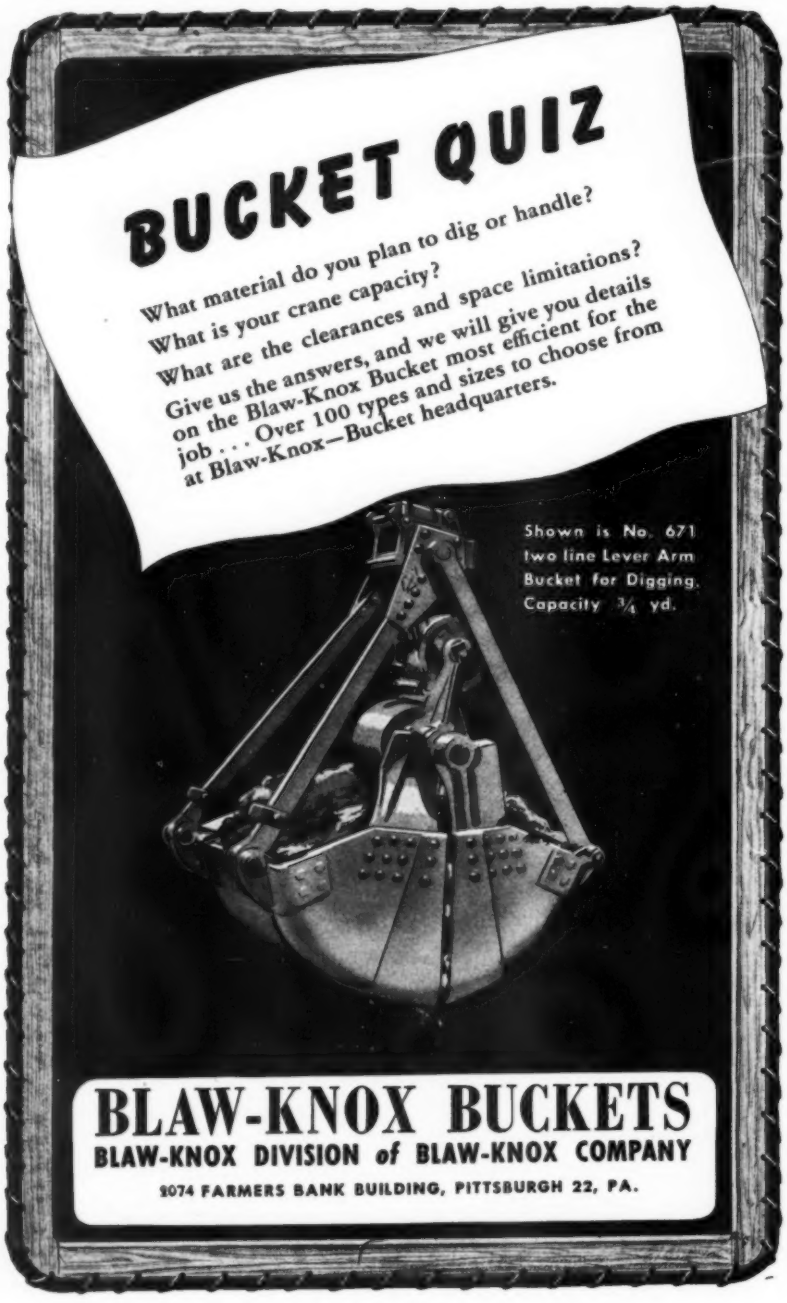
Typical page from the new Stoody Guidebook showing application of Stoody Hard-Facing alloys to construction equipment. Information is short and to the point. Illustrations are clear, easy to understand.

fied that if award of the contract is delayed past November 1, 1946, they will not be bound to accept it.

The Potholes Dam will be the largest of four earth-and-rock dams to be built as part of the Columbia Basin Project irrigation system which will include 4,000 miles of canals. Approximately 19,000 feet long, with a maximum height of 200 feet from lowest bedrock, the Potholes Dam will require 9,190,000 cu. yds. of fill. This would almost equal the volume of the Grand Coulee Dam, world's largest concrete dam, and key structure of the irrigation works. The Potholes Dam would be 4½ times longer than the Grand Coulee Dam.

Site of the Potholes Dam is about 15 miles west of Warden, the nearest railhead. It will close the Drumheller Channels, which were cut through the Frenchman Hills by the same glacial flood waters that carved the Grand Coulee. The dam will form the Potholes Reservoir, so called because it will include the Potholes area in the sand hills south of Moses Lake.

Specifications for the Potholes Dam include an open-channel, emergency spillway 500 feet wide, at the west end; an outlet works near the east end; and a roadway along the crest of the dam. The outlet works will consist mainly of a concrete-lined tunnel about 700 feet long and 7½ feet in diameter, inlet and outlet structures, and a concrete-lined vertical shaft 6 feet in diameter to provide access to a gate-chamber in the tunnel near the axis of the dam. The dam will consist mainly of moistened and rolled embankments of clay, sand, and gravel. Upstream slopes will be covered with a three-foot layer of rock riprap, and downstream slopes with two feet of rock surfacing.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What material do you plan to dig or handle?
What is your crane capacity?
What are the clearances and space limitations?
Give us the answers, and we will give you details on the Blaw-Knox Bucket most efficient for the job . . . Over 100 types and sizes to choose from at Blaw-Knox—Bucket headquarters.
Shown is No. 671 two line Lever Arm Bucket for Digging. Capacity ¾ yd.
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BLAW-KNOX DIVISION of BLAW-KNOX COMPANY
2074 FARMERS BANK BUILDING, PITTSBURGH 22, PA.

Construction Values Reach New Monthly High

The value of total new construction reached a new monthly high in August — $1,039,000,000 — increasing about six percent over July volume, according to the construction Division, Department of Commerce.

Privately financed construction of all types, valued at $828,000,000, accounted for about 80 percent of total August dollar volume.

Privately financed residential construction in August (excluding farm buildings, trailers and conversions) was valued at $355,000,000 an increase of 6½ percent over July volume and 466 percent over August a year ago.

The value of privately financed nonresidential construction was $335,000,000, two percent more than the July volume. Effects of restrictions on nonresidential building are reflected in the August figure, which showed a considerably lower rate of increase than that for previous months, the Construction Division pointed out.

Public utilities (privately financed) spent $78,000,000 for new construction in August, about seven percent more than in July. Of the total, nearly one-third was for telephone and telegraph facilities.

Total publicly financed construction was valued at $211,000,000 in August. This was an increase of six percent over July and about 10 percent over August 1945.

Future A.G.C. Meetings

Future meetings of The Associated General Contractors of America have been scheduled as follows: Governing and Advisory Boards, Benjamin Franklin Hotel, Philadelphia, Penn., October 21-22, 1946; 28th Annual Convention, Stevens Hotel, Chicago, Ill., January 27-30, 1947.

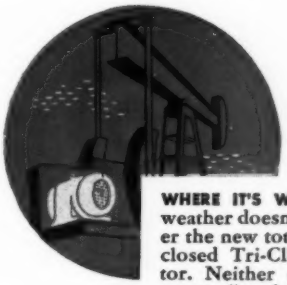
Corrosion Engineers

The National Association of Corrosion Engineers will hold its annual convention in the Palmer House, Chicago, Ill., on April 7, 8, 9, and 10, 1947.

Contract for Completion of Canals on Boise Project

Completion of the earthworks and structures of the "C" Line East Canal laterals and the Conway Gulch lateral on the Payette Division of the Bureau of Reclamation's Boise project in Idaho has been placed under contract, Commissioner Michael W. Straus advised.

FOR TODAY'S TOUGHER JOBS, HERE'S A NEW TOUGHER MOTOR



WHERE IT'S WET Wet weather doesn't bother the new totally-enclosed Tri-Clad motor. Neither do frequent "washdowns" in food plants.

WHERE IT'S CORROSIVE Acids, alkalis, and fumes are kept out of these new Tri-Clads. Cast-iron enclosures are corrosion-resistant, extra strong.

WHERE IT'S DIRTY Dirt and dust can't get into these Tri-Clads to shorten their life. Smooth surfaces are convenient to clean.

WHERE IRON DUST FLIES Harmful iron dust and metal filings can't get past the inner wall. Bearings are protected from dust.

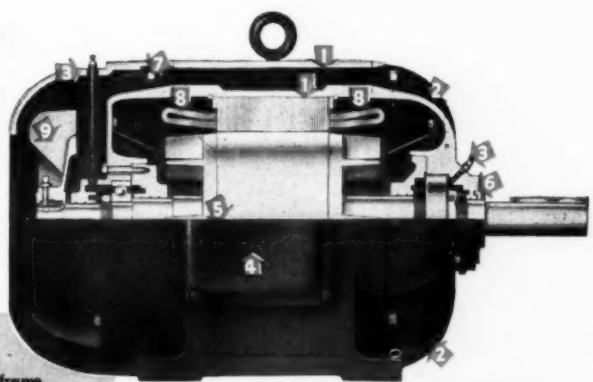
WHERE QUARTERS ARE CLOSE When space is limited for a totally enclosed motor, you'll like these trim, compact new Tri-Clads.

WHERE EXPLOSION HAZARDS EXIST The new Tri-Clad motors are available in explosion-proof constructions where needed.

THE G-E *TRI CLAD* TOTALLY ENCLOSED MOTOR

(1 TO 1000 HP)

In 1940 you welcomed the Tri-Clad open motor with it's *extra protection features*. More Tri-Clads have since gone into service than any other integral-horsepower motor. Now G.E. is ready with a new line of tough, totally enclosed Tri-Clad motors for use in adverse atmospheres. *We believe they are industry's most dependable motors*. Their longer life and lower maintenance will make them a sound investment on almost every job. Apparatus Dept., General Electric Co., Schenectady 5, N. Y.



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1. A cast-iron, double-wall frame completely encloses and protects the windings and punchings.
2. Corrosion-resistant cast-iron end shields are machined to provide a tight seal, and protect the motor from dust, dirt, and moisture. Primer and finish coat of Glyptal* varnish affords high rust-resistance.
3. A pressure-relief greasing system, which can be packed with long-life lubricant, protects the bearings.
4. The cast-iron conduit box is diagonally split for easy wiring. Boxes are independently explosion-proof on Class I motors.
5. Nonshrinking compound around motor leads protects motor interiors from dust and moisture at the point where leads pass through the frame.
6. Rotating labyrinth seal further protects motor interior from damage by foreign matter.
7. Large air passages provide adequate protection from overheating. They're easy to keep clean and open, too.
8. Modern, "ageless" insulation treatment includes windings of *Formex magnet wire.
9. The powerful external fan is removable to simplify maintenance; nonsparking type in explosion-proof motors.
10. Individual dynamic balance of rotors and external fans protects against vibration hazards, even under severe operating conditions.

*Trade-mark Reg. U. S. Pat. Off.

FOR THE COMPLETE STORY

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☐ Please send me GEA-4131, "Motors and Control for Hazardous Locations."

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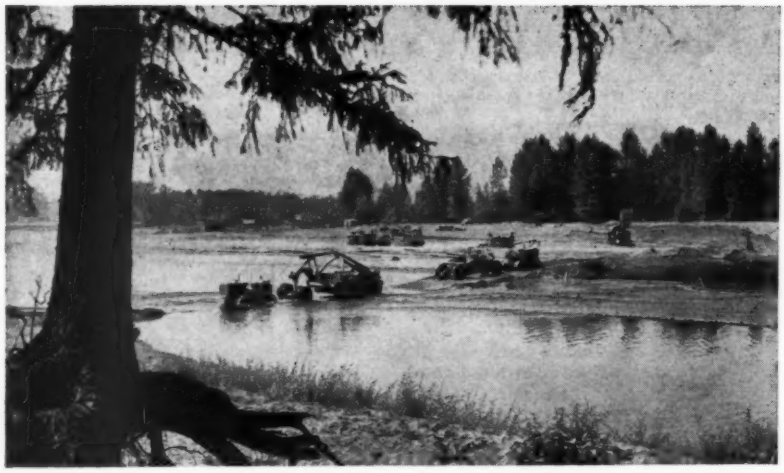

• Relocation of Pacific Highway 99E between Salem and Albany, Oregon. Building 9.8 miles of new highway to eliminate about four miles of sharp curves, hills and narrow road. Caterpillar D-8 tractors with LeTourneau and Gar Wood scrapers hauling heavy rock gravel across the Santiam River. Working 15 hours a day the units made eight trips per hour with 16 cu. yd. loads on a 1000-ft. haul. R. A. Heintz Construction Co. of Portland is doing the job.

The contract, amounting to $170,701 was awarded to Henry L. Horn, Caldwell, Idaho, the lowest of five bidders.

The work is situated about eight miles north of Caldwell. Major construction items include more than 260,000 cu. yds. of excavation, laying of more than 6,300 lineal feet of concrete pipe ranging from 15 to 54 inches in diameter, placing nearly 2,000 cu. yds. of concrete, and installation of 22,500 pounds of gates and miscellaneous metalwork. The work must be completed within 400 days after the contractor receives notice to proceed.

The Payette Division of the Boise project is located in southwest Idaho on the divide between the Boise and Payette Rivers. Water for the project will be supplied from the Payette River. Approximately 53,000 acres of land are included in the division. Much of this land was homesteaded about 30 years ago, but dry farming did not hold the early settlers, and most of the farms were abandoned.

Contracts recently awarded call for the construction of a 21-mile section of the "C" Line East Canal and all of the 24 miles of the "C" Line West Canal, and for a pumping plant and the pump discharge pipes to supply water to the canals. Bureau of Reclamation construction of the Black Canyon Canal in the late thirties brought irrigation water to nearly 28,000 acres of land. The 25,000 additional acres that will ultimately be served are situated on higher ground.

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Kentucky to Work Quarry to Offset Shortages

With an "acute" shortage of crushed stone threatening the state's road construction and maintenance programs, Kentucky's State Highway Department has gone into the quarry business.

Clem F. Kelly, department attorney, said the shortage had forced the department to enter the crushed-stone business "very reluctantly," since "the department has never entered into any business that has a semblance of competition with private individuals."

He added, however, that the department's participation in the stone business at this time was not considered competition with private enterprise, be-

Where can the Hercomites and the Gelamites save you money?

In strip mining, metal mining, quarrying, and construction, the Hercomites* and Gelamites* offer greater economy and effectiveness for many blasting jobs. *Investigate!*

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* REG. U. S. PAT. OFF. BY HERCULES POWDER CO.

XR-44

cause quarries are now working at capacity production without being able to supply state needs. "When the shortage ends," he promised, "we will get out of the stone business."

Kelly said the state had leased quarry property in Owsley and Carter counties. The department had the machinery to operate the quarries, he said, and would recruit the necessary labor.

Award Road Contracts For 44 Miles in Kentucky

Contract awards for forty-four miles of new bituminous surfaces in Greenup, Carter, Todd, Taylor, Muhlenberg and Larue Counties were included in official orders signed by J. Stephen Watkins, Commissioner of Kentucky Highways. These awards bring the total amount of awards made under the August 23rd and 30th lettings to $1,761,405.99.

Survey Earnings, Economics of Professional Engineers

The earnings and economic status of professional engineers before, during and after the war is the subject of a survey being made cooperatively by six professional societies and the U. S. Department of Labor.

This is the first major survey of the economic status of engineers since 1935, when, at the request of the American Engineering Council, the Bureau of Labor Statistics reported for the years 1929 to 1934. (B.L.S. Bulletin No, 682.) The new survey will supply information for the years 1939, 1943 and 1946. The data are to be collected by means of mail questionnaires, which will be completely anonymous.

"Approximately 125,000 engineers who received the questionnaires during September will have an opportunity to help in making available information of great value to their profession," said Col. Wm. N. Carey, Chairman, Engineer Survey Committee, Engineers Joint Council, and Executive Secretary, American Society of Civil Engineers. The data collected are intended to:

1. Permit individual engineers to compare their own status with that of others in their own engineering field and to appraise opportunities in other fields of engineering.
2. Assist employers in establishing appropriate salary scales.
3. Aid in the improvement of the economic status of engineers.
4. Provide information to schools and other institutions engaged in training or in vocational guidance of prospective engineers.

Questionnaires were sent by the Bureau of Labor Statistics in cooperation with the National Roster of Scientific and Specialized Personnel of the U. S. Employment Service to a representative sample of the 200,000 engineers registered with the National Roster.

At the same time, to provide information for the professional societies on the economic status of their members, an identical questionnaire will be sent by the Bureau of Labor Statistics, in cooperation with the Engineer Survey Committee, a Sub-committee of the Committee on the Economic Status of the Engineer, Engineers Joint Council, to approximately 90,000 members in the following societies: American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Institute of Chemical Engineers, and the National Society of Professional Engineers.

A special report on the economic status of members of the societies will be prepared by Andrew Fraser, Consultant to the Engineer Survey Committee, Engineers Joint Council.

Recommend Underground Garages in Philadelphia

Construction of three huge underground garages, as part of a multi-million dollar program to provide parking space for 20,000 additional automobiles in mid-city Philadelphia, was recommended to the Philadelphia City Council in a report submitted by the Philadelphia Committee for the Relief of Traffic Congestion.

Proposing that the City Bureau of Traffic Engineering be granted sweeping powers to carry the program into

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The fastest sports event in the world—Ice Hockey—demands the *utmost* in performance and endurance . . . no other test of skill can measure up to the call put to every player—regardless of his position.

Industry, too, has its specific wire rope standards—especially as to strength and adaptability. Whenever the job calls for dependable performance, "HERCULES" (Red Strand) can be relied upon to complete the operation — *economically*.

Since there is a type and construction especially made to fit every *heavy duty* requirement in *your* industry, you use good judgment when you select "HERCULES" (Red Strand) Wire Rope.

When an especially 'tough job' comes up—consult our engineering department.

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H. W. Holt & Son's Tournapulls stripped shallow overburden from American Aggregates Company's Columbus, Ohio gravel property.

SHALLOW OVERBURDEN stripped with TOURNAPULLS

H. W. Holt & Son chose Tournapulls for their stripping contract on the American Aggregates Company pit in Columbus, Ohio. Job runs over 180,000 yards and involves removing gravelly top soil 1 foot to 18 inches deep.

60,000 yards in 300 hours . . .

In the first 300 hours of operation, on hauls varying from 1500 to 2600 feet one way, job records show that the two Tournapulls have moved a total of 60,000 yards. That's an overall average of 100 yards an hour for each Scraper unit. The rigs spread stripped material along pit banks to landscape for a future lake on the site.

Fits job requirements . . .

Holt found their Tournapulls particularly well adapted to this job because: (1) They strip heaped loads just as efficiently along a few inches of overburden as they do on deeper banks, (2) maintain production on both long and short hauls, (3) combine and simplify load-haul-and-spread operations for minimum investment, with less manpower. (4) Job flexibility enables them to strip any section of the pit at any time and spread their loads evenly to landscape requirements.

Self-powered moves — another benefit . . .

Holt drove their Tournapulls 405 miles to the job in 28 hours driving time . . . will find this mobility a time and money-saver over normal equipment shipping delays between future jobs.

Put these savings to work for you . . .

These are just a few of the reasons why leading stripping contractors are turning to Tournapulls for lowest-net-cost-per-yard. It will pay you to ask your LeTourneau Distributor to check your stripping costs against modern Tournapull economy. See him TODAY.

POW

▲ En route to the job, Holt's big-tired Tournapulls made the 405-mile trip in 28 hours' driving time.

Tournapulls fit any type of dump problem . . . spreading for landscaping like this, disposal in mined out pit, piling on bank or in waste areas. ▼

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TOURNAPULLS

effect, the committee urged that the bureau be granted the right of condemnation for needed properties, in cooperation with the City Urban Redevelopment Authority, and that it be permitted to borrow money for the construction of garage facilities where needed.

Other sections of the committee's report lashed at overcharging of motorists for the use of parking lots and garages in the central-city area and recommended that no further restrictions on street parking be imposed until the city found means to control parking rates. To meet future needs, the committee recommended that the city building code be amended to require provision of off-street parking facilities in the construction of all new mid-city buildings. Three subway areas were ruled out by the committee as unsuitable for parking use.

Proposed by the committee as sites for underground garages were: Reyburn Plaza, Broad and Arch Sts.; Independence Hall Mall, proposed park area between Fifth and Sixth Sts.; and Pennsylvania Blvd., proposed drive on the present site of the Pennsylvania Railroad trackage between 20th and 23rd Sts.

Under the plan suggested by the committee, the city would be authorized to finance and construct the huge underground garages. They would be operated on a self-sustaining basis or leased to a private company through competitive bids for operation at fixed fees. It was recommended that the program be delayed only if private enterprise showed a willingness to undertake building needed garage facilities.

In accepting the committee's report as chairman of the City Council Committee on Public Safety, Councilman Clarence K. Crossan said:

"The proven success of the four-story underground garage beneath Union Square in San Francisco is evidence enough that the city and private interests can get together on a mutually profitable proposition for using such available sub-surface space.

"In San Francisco, all the city contributed was the right to use ground under an existing park. Private initiative and capital did the rest. Here in Philadelphia we are proposing that the city go one step further and provide capital for building one or more underground garages."

Crossan said the projects could be financed from long-term bonds at 1½ to 1¾ percent interest, repaid from parking fees.

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Jones Takes Post with Chinese Government

Fred O. Jones, chief geologist for the Bureau of Reclamation's Columbia Basin Project, disclosed that he has signed a two-year contract with the Chinese Government to supervise geological investigations for its giant Yangtze Gorge Dam.

He will direct Chinese geologists and engineer assistants in testing the limestone bedrock to determine the exact location of the billion-dollar river barrier planned to impound water to turn 96 hydro-electric generators and to irrigate 10,000,000 to 12,000,000 acres.

Start Construction Camp for Hungry Horse Dam

Development of a Government camp eventually to house personnel, construction equipment and material for the Bureau of Reclamations' Hungry Horse project in Montana, has been placed under a contract amounting to $401,377, Commissioner Michael W. Straus announced. The contract was awarded to the S. Birch and Sons Construction Company, Great Falls, Montana, the low bidder.

The contract calls for excavation for the building of streets, sidewalks, curbs and gutters, and drainage, sewerage and water-distribution systems. Major items of work include nearly 47,000 cu. yds. of excavation for streets, sidewalks and culverts; 58,000 lineal feet of excavation and backfill for water and sewer pipes; placing of 23,500 cu. yds. of compacted fill for streets and sidewalks, and other items.

The Hungry Horse project of the Bu-

(Continued on page 586)

Equipment you ought to KNOW ABOUT

Diesel-driven Welder

Manufacturer: Hobart Bros. Co., Troy, Ohio

Claims: This diesel engine driven arc welder of 300 ampere capacity is the newest addition to

the Hobart "Multi-Range" Welder line designed to be used in locations where electric power is not available. Powered by a two-cylinder, unit-ejection diesel engine which has a 4-½-inch bore and a 5-inch stroke, the unit with its patented "Multi-Range" Dual Control and remote control permits the operator to make fine volt-ampere adjustments right at the work.

Besides the 1,000 combinations of voltage and amperage which permits the operator to select the right arc intensity to suit any job, the welding generator includes separate excitation and two-way ventilation and has a rating of 300 amperes at 40 volts.

Improved Electrode

Manufacturer: Stoody Co., Whittier, Cal.

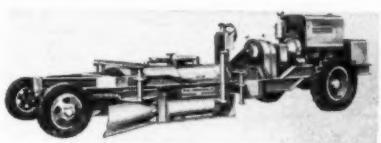
Claims: The new improved Coated Stoody Self-Hardening electrode for hard-facing all heavy equipment subjected to earth abrasion and impact differs from the dipped-type electrodes in that it possesses a new extruded flux coating which is said to improve welding characteristics and simplifies application. The uniform coating is placed on by means of a hydraulic press which gives it increased strength over dipped coatings. The electrode is available in ¼-inch, 3/16-inch, 5/32-inch and ⅛-inch rod sizes.

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

Wood Roadmixer Model 36

Manufacturer: Wood Manufacturing Co., Los Angeles, Cal.

Claims: An addition to the Wood line of road building equipment, the new Model 36 is a one-man operated, self-propelled, pneumatic tire-mounted traveling mixing plant, designed for maneuverability, speed and capacity. Capable of use for both small operations and large jobs, the machine handles soil, cement, tar cut-back asphalts, and emulsified asphalts, making a thorough mix in one pass. It handles up to 4 cu. ft. windrows, and produces from 100 to 150 tons of ready-to-spread mix per hour.



Fully rubber mounted, the mixer has a range of five speeds from 2 to 14 miles per hour, forward or reverse. For mixing, the Model 36 also has five speeds, ranging from 11.5 to 71 feet per minute.

Air Winch

Manufacturer: Joy Manufacturing Co., Michigan City, Ind.

Claims: A new, small, lightweight, air-powered hoist weighing only 85 lbs. that is capable of lifting 500 lbs. and has a rope capacity of 150 ft. of ¼-inch rope. Only 18 inches long, 9-½ inches high, and 11 inches wide, the winch is powered by a four-cylinder, reversible, piston-type air motor. Capable of being mounted in any position on car, timber, column, or bar, the machine has a conveniently operated brake-lever that holds the load firmly and prevents drum from spinning.

The unit can be used to hoist and lower machines and materials when driving a raise, dragging blocks and scrapers, hauling slushers into place, lifting and dragging timbers, pulling large jumbos or mine cars and moving large boulders.

Electrode for Welding Cast Iron

Manufacturer: Harnischfeger Corp., Welding Division, Milwaukee 14, Wis.

Claims: "Harcast", an all-position mild steel electrode for welding and repairing cast iron fuses well with either mild or medium carbon steel, thus enabling cast iron to be joined with other types of steel. With a yield point of 50,000 lbs. p.s.i., the deposited metal has an ultimate tensile strength of 60,000 lbs., roughly double that of a good grade of cast iron.

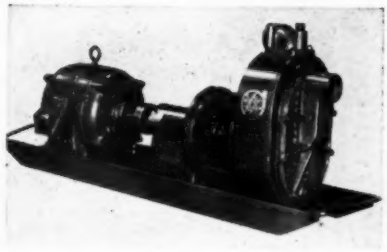
Usable with either AC or DC machines, works well at low amperage.

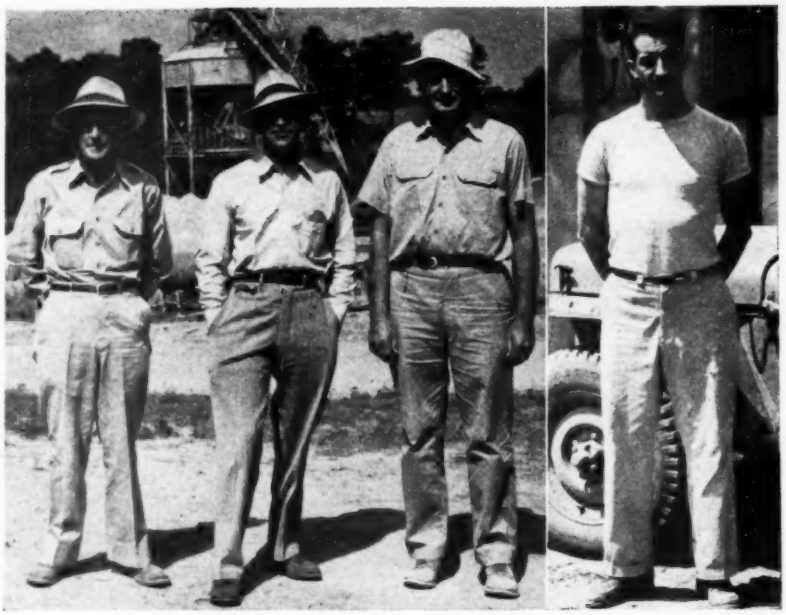
Mine Gathering Pump

Manufacturer: Marlow Pumps, Ridgewood, N. J.

Claims: Embodying the features of other Marlow self-priming centrifugal pumps, this new and improved Type EM mine gathering pump self-primes without ports, by-passes, or other auxiliary devices. There is no recirculation or wasted motion, and no parts which require adjustment or manipulation. The impeller alone moves the liquid and the simple design prevents clogging, jamming or other problems. It is self-priming on suction lifts as high as 25 ft. and retains its ability to prime even when large quantities of solids are handled.

Available in two sizes — two inches and three inches with 2 HP and 3 HP motors—the pump capacity is 40 to 240 gpm. and is said to cut mine drainage costs.





• G. M. Gaussa (center), project manager for the contractor, is snapped with J. B. Romans (right), resident engineer, and W. B. Machin, general superintendent for the subcontractor on excavating. At the extreme right is W. L. Williams, contractor's assistant project manager.

Ohio's Delaware Dam

(Continued from page 547)

dled by blasting with Du Pont 30% gel, using Du Pont electric detonators. The limestone lay in layers 2½ ft. thick and 1½-inch holes were drilled with four to seven Worthington jackhammers using Timken bits and powered by two Worthington air compressors, to the depth of the layer. Holes were spaced 3½ feet apart and four feet back, with an average of 800 feet of hole drilled per day. Each hole was loaded with ¾ of a stick of explosive and 150 to 200 holes were shot at one time. The ratio of explosive to rock broken was about ½-lb. to the ton, with no secondary blasting required. Shooting was done twice daily—at noon and in the evening. As a special safety precaution, all men were removed from the area.

For excavating the prepared rock, subcontractor used a ¾-cu. yd. Northwest shovel, loading to the Euclid wagons mentioned earlier. The rock was separated as to size and dumped in piles about 500 ft. from the rock excavation for later use as riprap and derrick stone to protect the embankment adjacent to the masonry dam as described earlier.

Because the concrete spillway is not to be built in the original river channel, diversion of the stream is not necessary until much of the concrete construction is completed. To protect the spillway site and allow construction to continue until it has reached the point where the spillway is ready to have the stream diverted through it, a cofferdam, designated as Stage 1 Cofferdam, was constructed by the contractor. It is 1500 ft. long and constructed on the left bank of the river (looking downstream) and encloses the site of the west abutment, the spillway, east abutment, wingwalls, and the embankment adjacent to the east abutment.

This cofferdam is a combination cellular sheet pile dam with earth fill, rock filled timber crib and rolled embankment. The contractor originally planned to use sheet steel pile throughout, but the steel strike last Spring forced resorting to timber cribbing in order to permit work to continue on schedule. The cells in the sheet pile section measured 26 feet in diameter.

Specifications required raising

LABOR Saving SPELLS ECONOMY with SAUERMAN Equipment!

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In the picture above a small SAUERMAN Scraper is digging gravel from pit and delivering to crushing plant, moving 45 yards of material per hour. The operation is an easy one-man job.
Whether you must handle only a few or many thousands of yards per day, there is a type of SAUERMAN Long Range Scraper Machine to meet your exact requirements. Low installation cost. Simple upkeep. Small power consumption, electric, gasoline or Diesel. Operation is easily mastered by anybody. Write for Illustrated Catalog and specifications of different sizes of machines with handling capacities from 20 to 500 cu. yds. an hour.

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THE ABILITY of Bucyrus-Erie 3/8- to 2 1/2-yard excavators to deliver a higher percentage of working time every day is one of the big reasons why they've proved their output superiority on every type of excavating job.

In their design the most careful consideration has been given to features that eliminate or reduce delays: adjustments that "stay put" are easy to make; machinery is arranged so that repairs, replacements, lubrication, etc., can be handled quickly; parts are kept simple, large, few in number — there is little that can go wrong; *all* operating control levers are conveniently grouped so that the operator can stay at his position and are easily manipulated to reduce operator fatigue; the digging cycle is smooth, balanced, and coordinated so that there is no overstressing of parts or excessive wear.

These and other Bucyrus-Erie features let you tackle a regular diet of day-and-night jobs with every assurance that you'll get a higher percentage of actual working time — and output — each shift.

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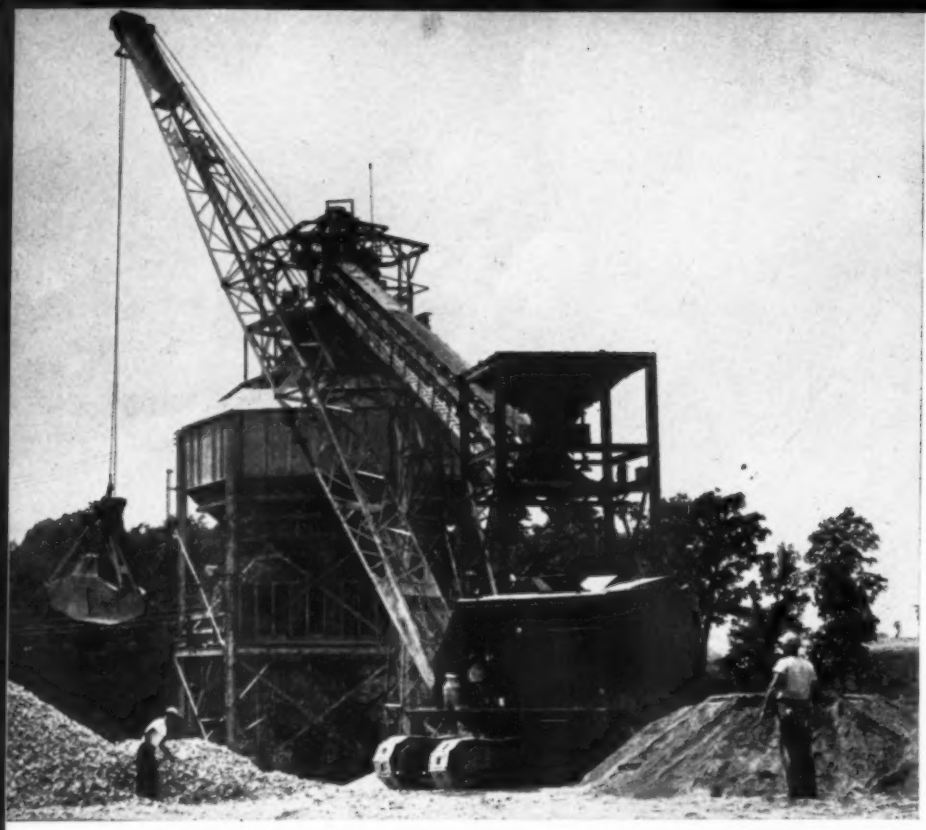
SOUTH MILWAUKEE WISCONSIN



• Aggregates are loaded to hopper feeding the mixing plant by a Bucyrus-Erie 44-B equipped with a 2-cu. yd. Blaw-Knox clamshell bucket.

the Stage 1 Cofferdam to a height of about 26 feet from the rock foundation of the masonry dam. Placing of the steel sheet piling was handled by a Bucyrus-Erie 44-B diesel crane equipped with a 55-ft. boom and a 15-ft. jib extension. Driving was done with a McKieran-Terry 7-B hammer. Earth and rock fill for the cofferdam was obtained from the material excavated at the spillway site.

Cofferdam No. 1 will be maintained until most of the masonry dam is completed. Two of the spillway monoliths, however, will be left low (not exceeding El. 893). The stream will then be diverted by building an upstream earth dam across the river channel, forcing the stream into the spillway through the spillway sluiceways and the two low monoliths. The upstream arm of the second cofferdam will be built to at least El. 907 and the downstream arm to minimum El. 894. The contractor indicated that construction of this dam would probably be handled by bulldozers, scrapers, and possibly draglines loading to Euclid wagons. The spillway monoliths left low will be brought up after the removal of Cofferdam No. 2.

During construction of the first cofferdam, the contractor also erected a concrete mixing plant adjacent to the spillway site. A Lorain Moto-Crane, used for general utility work, handled the lifting work during construction of the plant.

When the site was visited, work at the spillway had progressed to the point where concrete was being placed in alternate monoliths of the east abutment, while the rock foundation of the west abutment was being prepared. The general plan of construction was to build the east abutment, west abutment, and spillway in that order.

Concrete was being placed in the monolith forms by a Bucyrus-Erie 54-B crane which handled the concrete buckets with a 100-foot boom. The buckets were principally seven two-yard Dravo-Doyle bottom-dump buckets; four one-yard Blaw-Knox buckets were also in use.

The crane placed concrete at an average rate of 600 cu. yds. per day, with a minimum of 400 cu. yds. and a maximum of 1000 cu. yds.

The concrete buckets were brought within range of the placing crane by flat bed trucks, the number varying from three to six, depending upon the length of haul, which in turn depended upon the location of the abutment monoliths being constructed. A haul of about 400 feet was required for placing concrete in the extreme north monoliths of the east abutment. Four trucks were being used for this distance.

Vibration of the concrete placed into the forms was handled by means of five Vibra Spades, each

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• U. S. Engineer representatives at the dam site are A. A. Johnson (right), resident engineer, and J. L. Marsters, assistant resident engineer.

operated by two men, and five one-man Viber vibrators.

The buckets were charged on the trucks in an underpass beneath a C. S. Johnson electric batching and mixing plant equipped with two two-yard Smith tilting mixers. The plant, completely automatic, batches water and cement while the fine aggregates are cumulatively weighed on two separate dial scales. The batches are discharged into a revolving turn head which automatically selects the empty mixer. Both mixers discharge into a collecting hopper.

Aggregates reach the concrete plant by means of a 100-ft. by 30-inch conveyor belt connecting the 650-ton aggregate bins at the top of the plant with a hopper, to which aggregates are loaded by the Bucyrus-Erie 44-B equipped with a 2 cu. yd. Blaw-Knox clamshell bucket.

Aggregates are hauled by 5 yd. Ford dump trucks from a Pennsylvania railroad siding located approximately one mile from the mixing plant. Hopper-bottom railroad cars bring the aggregates from Marble Cliffs Quarries, American Aggregates Corp., and National Lime and Stone Company, of Columbus and Marion. At the siding, aggregates are unloaded from the cars by means of a 30″ Greenville conveyor belt which carries them to the charging bin. The trucks dump the aggregates on stock piles at the dam site.

The bulk cement is also shipped in by rail but is unloaded at a separate siding, hauled to the site by a special-body Ford dump truck of 40-bbl. capacity, and dumped into an elevator at the mixing plant which carries the cement to a bin in the center of the batching plant.

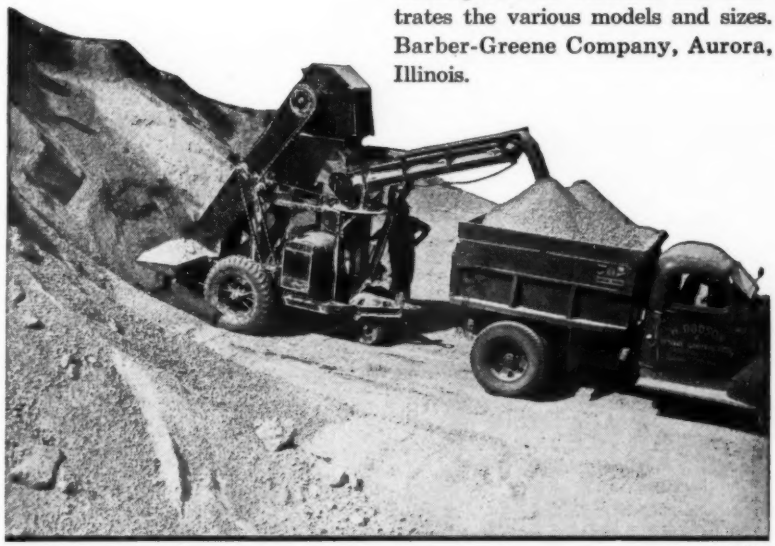
Specifications require the use of three classes of concrete in constructing the spillway and abutments. 600 cu. yds. of class "A" concrete, having a maximum aggregate size of 1½-inch, and 5½ bags of cement per yard will be used. Of class "B" concrete, having maximum aggregate of 3-inch, and 4½ bags of cement, 25,000 cu. yds. will be used. In the third or "C" class, falls the biggest bulk of the concrete: 49,000 cu. yds. Concrete in this class has a maximum six-inch aggregate

How BG Bucket Loaders Save Truck Time

• Saving truck loading time is the equivalent of adding trucks to your fleet. And, Barber-Greene Bucket Loaders *are* saving truck time every day through their high capacity and efficiency in loading from stock piles. They're specially designed for this job—a job no other method approaches from the standpoint of saving time.

In addition, Barber-Greene Bucket Loaders are easily maneuvered around the yard or pit, and, where conditions warrant, can be equipped with a special high travel speed for moving from stock pile to stock pile.

The Barber-Greene Bucket Loader Catalog No. 82 describes and illustrates the various models and sizes. Barber-Greene Company, Aurora, Illinois.



48-5A

BG Barber-Greene CONSTANT FLOW EQUIPMENT

and contains 4 bags of cement per cubic yard.

To effect a grout curtain seal along the upstream face of the spillway, specifications require the drilling of grout holes into the rock foundation along a line extending between the earth embankments. Holes will be two inches in diameter, drilled on 20-foot centers to a depth of 30 feet. Intermediate holes will be drilled if necessary to get required grout curtain. The contractor indicates that the holes will be drilled with diamond drills with the job handled on sub-contract by Joy Manufacturing Co. of Pittsburgh.

The holes will be pressure-grouted with cement, sand, and water, 100% passing a No. 28 sieve and not more than 25% passing a 100-mesh sieve. Generally, grouting pressure is to be one pound per square inch for each foot of hole depth, with grouting continued until the hole takes grout at the rate of one cubic foot or less of grout mix in ten minutes. The grouting will be handled by the White-McColl Co. of New York.

Building of Delaware Dam at the site selected will necessitate the relocation of a few miles of highways and utilities, but this work is not included in the dam construction contract. There will be approximately six miles of highways to relocate five miles of power lines, three miles of gas lines, and four miles of telephone lines.

One of the items in this work will be the ramping to a maximum of 10 feet of U. S. Highway 23, which will intersect the east-west portion of the west earth embankment.

The dam construction contract does, however, call for a certain amount of other ramp and access road building. In general, this construction will include five parts:

(1) Construction of a 15-ft. wide, one-fourth mile long access road from U. S. Highway 23 to the operator's house, including the turn-around.

(2) A 15-ft. wide (about 600 ft. long) road connecting the above access road with the control house at the west abutment of the masonry dam.

(3) A 15-ft. wide road from the east abutment to a turn-around about 650 feet away, turn-around included.

(4) A 15-ft. wide ramp crossing near the halfway point of the east embankment where the Panhandle Road crosses the embankment.

(5) A 15-ft. wide ramp crossing near the extreme tip of the east embankment where the Leonardsburg Road intersects.

The foregoing access roads and ramps will be of waterbound macadam construction. They will consist of eight inches of crushed stone totalling 970 lbs. per sq. yd. Coarse aggregate will make up the major part of this weight with screenings used for blanketing the subgrades, for voids, and for surface dressing. After excavation of the subgrades, a layer of screenings will be applied, moistened, and rolled to a smooth surface with a power roller. Then the coarse aggregate will be applied, spread, and rolled, after which more screenings will be used to fill the interstices. Sprinkling to saturate the macadam will be followed by rolling, with sprinkling and rolling to continue until a grout has been formed of water and screenings to fill all the voids. Specifications require the water binding process to be handled in sections of 200 feet or less.

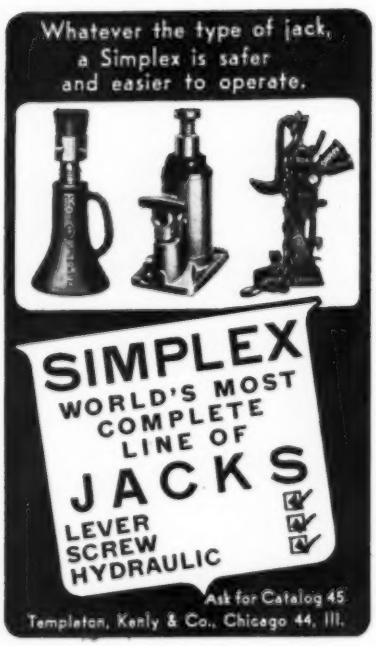
The contractor has indicated that the excavating and other phases of this construction will be handled by the excavating subcontractor. At this writing, the equipment to be used has not been designated.

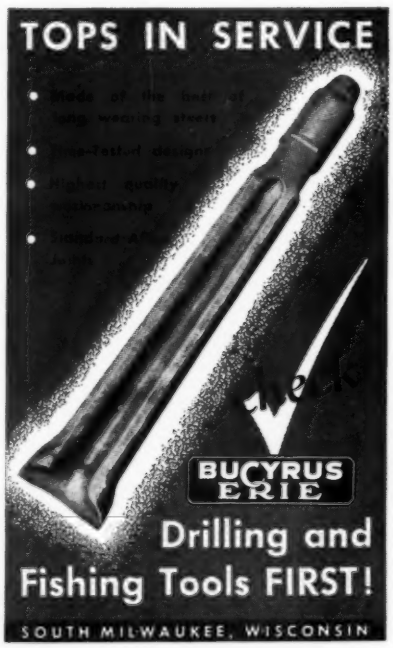
Construction of the dam is proceeding on schedule in spite of early delays occasioned by bad weather in April. Exceptional progress on the earth embankments has more than offset the retardation caused by the heavy spring rains.

Executive representatives of the joint-venture contractor at the dam site are G. M. Gaussa, project manager; W. L. Williams, assistant project manager, and J. B. Romans, resident engineer. General superintendent for the subcontractor on excavating is W. B. Machin.

The project is under the supervision of the U. S. Engineer Office at Cincinnati, where Lt. Col. Geo. W. Kibler is district engineer, and N. G. Fasnacht is chief of the construction division. The resident engineer for the U. S. Engineer Office is A. A. Johnson. J. L. Marsters is assistant resident engineer

For maintenance and repair of equipment, the contractor maintains a field repair shop on the site with a ten-man crew of mechanics, electricians, and welders.





NOT in the *Contract*

The work relief interviewer looked the applicant squarely in the eye. "Now, Mr. Palnik, what about your family? You have a wife, children?"

"Yes, lady, yes. I must have job. So much trouble. My wife she gone to her folks. My children all at orphans' home. You no give me job I lose my Ford."

The judge had just awarded a divorce to a wife who had charged non-support.

"And," he said to the husband, "I have decided to give your wife $50 a month."

"That's fine, judge," the man replied, "and once in a while I'll try to slip her a few bucks myself."

The letters the negro preacher added after his signature were B.S., M.S., and Ph.D.

Finally, one of his flock was aroused to ask him how he derived these academic decorations.

"Well," replied the parson, "You know what B.S. means, don't you?"

"Sho, sho, ob course," replied the enquirer.

"Well, den, for yo information," said the parson, "M.S. means 'more of same,' and Ph.D. means 'piled higher and deeper.'"

Arriving at a strange hotel, a fussy woman thought she'd better know where the fire escape was. So she started exploring. During her tour, she opened a door and found herself in a bathroom occupied by an elderly gentleman.

"Oh, I'm sorry!" she twittered, "I was looking for the fire escape."

Continuing her search, presently she heard the pad of bare feet behind and a shout that made her turn. It was the elderly man, clad in a bath towel.

"Wait a minute!" he gasped. "Where's the fire?"

"Must I bare everything?" she asked.

"No, no," said her counsel, "Merely cross your legs."

Arriving home earlier than usual, a husband found his wife in the embrace of a friend. The friend asserted himself, "Now that you've trapped us, let's have this thing out, man to man. I love your wife and she loves me. Will you play a game of gin rummy for her?"

"Yes, but how about playing a penny a point on the side to make it interesting?"

"Back home they calls me 'Eight-Gun Sam.'"

"If they call you 'Eight-Gun Sam' why don't you carry eight guns?"

"Cain't. Mah pants keep fallin' down."

Mike: "'Tis a fine lad you have here. A magnificent head and noble features. Could you loan me a couple of dollars?"

Pat: "I could not. 'Tis me wife's child by her first husband."

Once upon a time a beautiful girl was walking through the woods when she came upon a poor little frog who spoke as follows:

"Lady, once upon a time I was a handsome prince but a big black witch turned me into a frog."

"Oh, that's too bad," said the beautiful girl. "Is there anything I can do to help you?"

"Yes, indeed," replied the frog. "If you will take me home with you and put me on your pillow I will be saved."

So the beautiful girl took the poor little frog home with her, and the next morning when she awoke there beside her was a handsome young prince. And, do you know, to this day her mother still doesn't believe that story.

He: "Is my face dirty, or is it my imagination?"

She: "Your face is clean; I don't know about your imagination."

"If you're looking for my husband, he's gone fishing. Just walk down to the bridge until you find a pole with a worm on each end."

By Marvin Townsend

"The Boss told me to work like a beaver and I'd get a raise!"

• Excavating work preceding the building of a pier for the Hawkesbury River Bridge, New South Wales, Australia, in 1886. The Union Bridge Co. of New York was awarded the contract for the foundations of this double track steel railway bridge across the Hawkesbury River, 30 miles north of Sidney. The river bed was made up of mud and sand to a depth of 185 ft. below high water. The rails are 42 ft. above high water and so the total height from the bottom of the piers to the rails is 227 ft. Pier foundations were dug inside coffer dams with an orange peel type bucket.
Photo from The Bettmann Archive

DO YOU OPERATE
AN $18,000 BUCKET?

If you operate an $18,000 crane on *bucket work*, you most certainly operate an $18,000 bucket, for your entire crane investment during that period depends upon the efficiency of the bucket. We know a contractor who operated a used ½ yd. bucket when an analysis of the job and crane called for a ¾ yd. bucket. *In ordinary excavating work he lost 10 cu. ft. of pay load on every bucket cycle.* Do a little figuring or better yet, wire us collect the capacity of your crane, the boom length, and the material handled. We'll give you facts that will mean more profits on bucket work—help you get the most out of your crane investment on bucket work.

ERIE STEEL CONSTRUCTION CO.
4610 GEIST RD., ERIE, PA.
BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

Shots from the Firing Line

(Continued from page 578)

reau of Reclamation is located on the South Fork of the Flathead River, 25 miles from Kalispell, Montana. It will provide regulation of the Columbia River to increase the firm power production at Grand Coulee and Bonneville Dams. The dam is also necessary, the reports pointed out, as the first step in providing irrigation water for approximately 100,000 acres of undeveloped land in the vicinity of Kalispell.

Present plans call for a straight gravity type concrete dam 450 feet high above the stream bed. A power plant of 142,000 kilowatt capacity is also included in the plan.

Contract on Jordan Narrows Siphons Goes to Warren

Earthworks and structures for the Jordan Narrows siphons, on the Bureau of Reclamation's Provo River project in Utah, will be constructed under a contract, amounting to $162,498, which Commissioner of Reclamation Michael W. Straus authorized for award.

Work on the project, located 20 miles south of Salt Lake City, will be done by Carl B. Warren, Pleasant Grove, Utah, the low bidder. It involves excavation for pipe trenches and for structures, placing and compacting of backfill, pouring of concrete in the structures, and installation of slide gates, hoists, trashracks and other metal work. The contractor must also manufacture and lay 69-inch diameter concrete pipe. The job must be completed within 250 days after the contractor receives notice to proceed with construction.

Improve Mexican Airports

The airline, Lineas Aereas Mexicanas, S.A., which is a subsidiary of United Airlines, proposes to spend $4,000,000 in improvements of its facilities in Mexico within the next year, according to the Office of International Trade, Department of Commerce.

Improvements already completed include modern airports and terminal facilities at Torreon and Ciudad Juarez. The company plans to request landing rights in El Paso to improve present service.

OBITUARIES

FRED W. STIEFEL

Fred W. Stiefel, 52, prominent tunnel engineer who headed the Stiefel Construction Corp., 595 Madison Ave., New York, died July 25 as a result of injuries suffered in an automobile accident while driving from Syracuse to his home in Milton, N. Y.

Among the underground projects on which Mr. Stiefel worked in his 33-year engineering career were a number of sections of the New York subway system, the Queens Midtown Tunnel, the Holland Tunnel, a 15-mile stretch of the

Delaware aqueduct at Wawarsing, N. Y., and a sewage plant on Ward's Island to serve sections of Manhattan and the Bronx.

He received the Construction Engineering Prize for 1944 awarded by the American Society of Civil Engineers for his company's work in sinking an inclined mine shaft and opening the Fisher Hill Mine in Minersville, N. Y. The shaft opened an extensive iron ore deposit near Lake Champlain and the Stiefel Corp. was engaged by Republic Steel Corp. to perform the actual mining of the ore.

Projects with which he had been associated also included construction of the New Gatun Locks of the Panama Canal in 1940. The government abandoned the project at the outset of the war when the work was about 10 percent completed.

Mr. Stiefel's work was mostly done for Samuel R. Rosoff, Ltd., contractors, of 292 Madison Ave., New York. He joined that firm in 1925 as assistant chief engineer and became chief engineer two years later. He left the Rosoff company in 1943 to form his own construction firm.

Many innovations in tunnel construction were introduced by Mr. Stiefel, including the use of Diesel locomotives and of Diesel shovels. He brought welded steel pipe into use for by-passing gas mains, replacing the more cumbersome cast-iron fittings. He also claimed to be the first to place street decking on underpinning piers for the support of elevated columns, and also the first to use the cofferdam method of supporting buildings on the sides of a subway cut, instead of the method of direct underpinning. For hard-rock drilling, he was credited with the development of a new type of bit, which increased the speed of drilling and reduced costs on drill repairs and steel breakage.

His wife, the former Evelyn Eberhardt, was with him at the time of the automobile accident but was uninjured. Also surviving are three small children, Bonnie, Fred W. Jr., and Walter W. Stiefel.

• Shovel in foreground loads kaolin while dragline to rear strips overburden at Gordon Clays, Inc., Gordon, Ga. The kaolin is used for making ceramics.

Authenticated News Photo

ALBERT SEARS CRANE

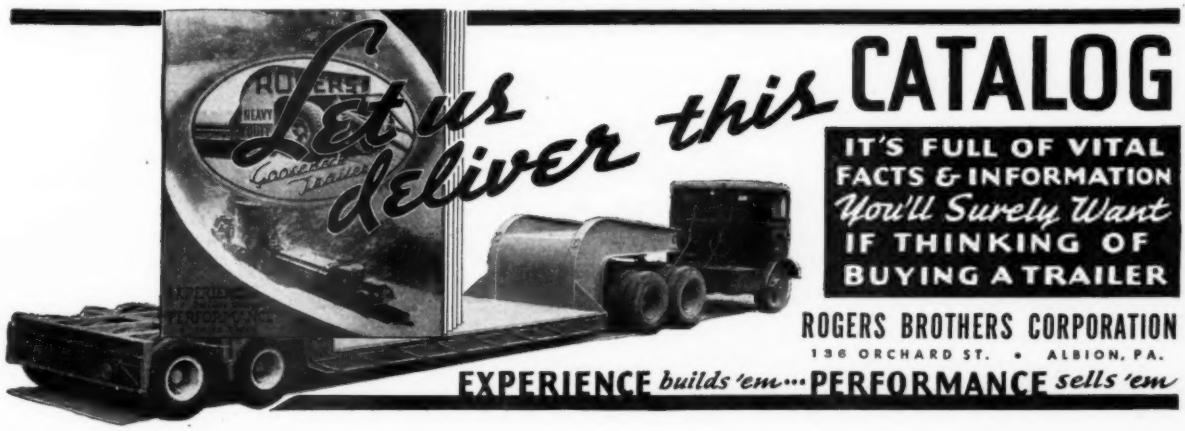
Albert Sears Crane, 78, retired prominent hydraulic engineer and former vice president of the J. G. White Engineering Corp., New York, died Aug. 25 at Bar Harbor, Me., where he was on vacation. His New York home was at the Engineers Club.

A specialist in the design and construction of large earthwork dams, Mr. Crane was engaged in 30 such construction projects during his career. He also was associated with the construction of 60 masonry dams, 40 hydro-electric stations and six large irrigation projects.

Born in Addison, N. Y., he was graduated from Cornell University in 1891 and shortly thereafter became an assistant engineer with the Department of Sewers in Brooklyn, N. Y. He subsequently served as chief assistant engineer with the Michigan Lake Superior Power Co., chief engineer of the Lake Superior Power Co. and principal assistant engineer with the Chicago Drainage Canal.

Joining the staff of the J. G. White Co. as a hydraulic engineer in 1905, Mr. Crane was named vice president eight years later and continued in that capacity until 1928, when he became a consulting hydraulic engineer. While serving in the latter post, he negotiated a contract and plotted the designs for ten irrigation projects in Mexico in cooperation with the Mexican government.

Mr. Crane was a member of several engineering societies, including the American Society of Civil Engineers and the American Institute of Electrical Engineers.


ROGERS
HEAVY DUTY
Gooseneck Trailer
Let us deliver this CATALOG
IT'S FULL OF VITAL FACTS & INFORMATION You'll Surely Want IF THINKING OF BUYING A TRAILER
ROGERS BROTHERS CORPORATION
136 ORCHARD ST. • ALBION, PA.
EXPERIENCE builds 'em··· PERFORMANCE sells 'em

• Dam and quarry. Waste surcharge starting in lower right. Seal trench cutoff approach in lower left. Clay at elevation 2780, main quarry run at 2850. Sluicing upstream and downstream fills. Marion shovel starting spillway lip in upper right center. Last coyote shot is directly under highest point of quarry slope.

Nantahala Diary

(Continued from page 551)

the congestion at the main quarry, was the use of tunnel muck from spoil piles at the four main portals. Close to 150,000 cu. yds. of hard rock is involved in the tunnel excavation and job officials were careful from the beginning of operations to place this material where it could be economically reclaimed. Spare loading units were assigned to this work and Euclid trucks, heaped high, made as long as three-mile runs, but kept the material coming when it was needed.

August 8—Mention should be made of the varied uses of shovel and dragline equipment in conjunction with bulldozers handling back-filling operations which have been necessary so far and which become increasingly important. Tunnel portals, intake structures, tailrace walls, and even power house and penstock foundations are now being concreted. The many activities and locations and inaccessibility of some call for a wide range of flexibility in the equipment and its use. The light 10-B has been easy to move about. It gets into small, crowded areas.

August 15 — A mud seam encountered in Tunnel No. 1 caused a major delay and special operations there. The fault was not extensive, as determined by exploration holes, but it was necessary to dispose of the large flow of mud and water, and to drive a timbered crown drift through the area into solid rock. The section was then enlarged to full size, allowing for timber posts, wall plates and sills.

August 22—With operations at high pitch, note should be taken of the excellent work done by the shop and facilities crews. The chief electrician and the master mechanic were ever alert to take steps for preventative maintenance, but 24-hour operations made many emergencies necessary. On one occasion, the main crusher was completely taken apart in the field and new parts made and inserted. The need was so critical that repair was carried on for 56 hours, continuously through day and night and much of it in driving rain. Hats off to those boys, they earned their keep for many weeks on that one job.

August 30 — Continuing that line of thought, especial attention should be called to the excellent pneumatic tool shop. The "drill doctor" at each location rendered mighty important "clinical" service as well as producing tip-top machines for all crews. Examination of the drills as they came into the shop often assisted in improving related operations. Worn chucks might mean improper shanking in the forge shop. Heavy piston replacements pointed to a need for more care in preparing the bits. Sticky valves or scored parts indicated high air pressure or faulty line lubrication. The orderliness and cleanliness of the shop at the dam was a model to copy on any job, large or small.

September 8 — The impervious fill section of the dam is the only portion that can seal against leakage, and instructions are given to make this installation as nearly perfect as possible. Among the specifications for placement are limits of layers placed such as: Two-inch layers and hand tamping next to rock, and six-inch layers and sheepsfoot roller on successive layers. The speed of the roller was designated as not to exceed 2½ mph and no "tracking" of equipment is permitted. Compaction and moisture control by soil engineers will determine the satisfactory condition of borrow pits, and finished fill. Mixing of various soils might be necessary.

September 15—Main equipment used on this work were LeTourneau and Wooldridge 12-cu. yd. carry-type scraper pans, towed by

• This panoramic view shows (from left to right) the left abutment, main quarry run fill, clay, upstream blanket, spillway entrance, crusher plant, and clay borrow pits.

D-8 Caterpillar tractors. The pits were at an average of 2000 feet from the dam, and were stripped by bulldozers, draglines and scrapers, with average overburden about 28 inches. Most of the pits were on a sloping side hill which allowed good drainage, and were just a little lower than middle height of the dam. This necessitated some serious grades as the fill became higher. Also, due to variance of upstream and downstream completed slopes, the fill became narrower near the top, causing tight turning and passing conditions.

September 22—Although rains held up clay handling operations at the start, better weather has now allowed higher average placement. For a current week we find the following data reported:

Item	Time		Production	
Four Carry-Scrapers	Scheduled	Operated	Total C.Y.	C.Y. Per Op. Hr.
	448 hours	382 hours	11,029	29

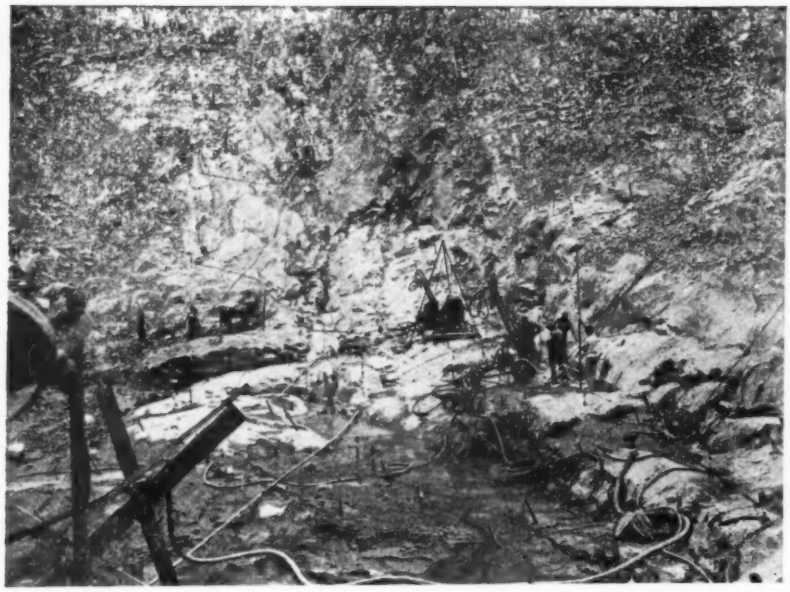
September 30—The graveyard (midnite to 8 a.m.) shift has now been discontinued since operations are narrowing in at the top of the dam. Yardages placed to date total more than 1,500,000 cu. yds. in the dam proper, not to mention considerable stripping, waste and spoil yardage. The last coyote hole was shot successfully on September 17, making nearly 600,000 cu. yds. solid moved by this method to date.

October 8 — Something should be said for the most adequate lighting that was maintained for night work in the extensive dam area. By innovation and a happy thought there were acquired some large lights from excess stores in Hollywood studios. These, in addition to local floods, on skid-mounted towers, gave safe and fast operation possibilities to the after-dark crews. Operators say there is little distracting glare.

October 15 — There were so many jobs to do and such a wealth of equipment available from the central company yard and other jobs, that generally the most efficient apparatus was utilized for any particular portion of the work. The sluice guns which did such a good job on the dam stripping, and the high-head, large volume pumps which supplied them, were just the ticket for consolidating the rock-fill by washing down fines into fill already completed. Streams could be easily directed out of the way of hauling units, and be controlled

• Heaving action is good as last coyote hole is shot on Sept. 17, making a total of nearly 600,000 cu. yds. removed by this method to date.

• Right, Top: Sluicing upstream. Scraper, Euclids and Dumptor are on dam. Right, Lower: Washing quarry run rock near crest of dam. Below: General view, looking toward left bank, of the dam on Oct. 22. The dark streak on the crest is clay extending into cutoff trench excavation near control house.



• Left: Diamond drilling in impervious seal base. Grouting in lower right. Above: Impervious seal cutoff trench and bypass shaft house (First concrete pour).

according to the material washing needs.

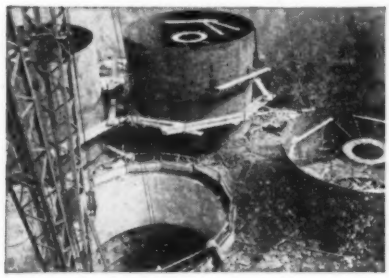
October 22 — Another example of diverse use of equipment was the skill with which the draglines were operated on a variety of tasks. There always seemed to be random piles of usable material accumulating, many in places difficult of access to trucks. The seal trench was a notable example, from which excavated material was often placed direct into "pay yardage." At times, skip pans were used, at other times light trucks navigated narrow passes. An exceptional job was the removal of over 12,000 cu. yds. of earth and soft rock to form a cutoff trench on the left abutment.

October 31—Let us not forget the wonderful job done by the drilling and grouting crews at the dam and other locations. There were nearly 15,000 linear feet each of diamond core-drilling, and of wagon drill percussion drilling. Over 1100 feet of grout holes were made in tight places by the use of jointed drill steel. In tunnels, shafts, gate sills and slots, seal trenches and in power house structures, over 94,000 cu. ft. of grout was pumped to ensure adequate backing of imbedded metal, liners, and for other structural considerations.

November 8—In the meantime, things are also happening at other locations. The penstock common excavation has reached nearly 50,000 cu. yds. under bad slope, depth and interfering conditions. By drag scraper, over Portal No. 1, dangerous ground was removed to an elevated hopper under which small trucks could drive and then haul to make fill used for plant facilities.

Concluding Installment of Job Engineer's Diary of Nantahala Hydro-Electric Project will be published in a coming issue.

• Right: Dangerous ground is removed by drag scraper over Portal No. 1 to an elevated hopper under which small trucks could drive. The material was hauled for fill for plant facilities. Below: Surge tank shaft 19' 9" diameter and sections of removable liner pipes.

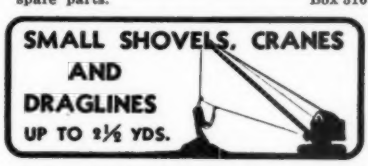


TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Electric dragline 200′ boom 20 yd. bucket.
Box 3181

Used Marion Model 350 electric shovel reasonably priced, central location with stock of spare parts. Box 3167



¾ Bucyrus & 1 yd. Northwest shovel — dragline.
Box 3180

Lorain Model "75" gasoline powered shovel, cat. mtd. Serial No. 3576. Located Coalmont, Colorado.
Construction & Power Machinery, Inc.
270 — 23rd St., Brooklyn, N.Y.
Tel. South 8-4900

One Osgood steam shovel No. 1212 on caterpillar treads. ¾ yard, heavy duty, in fair condition.
The Permutit Co., Birmingham, N. J.

The following equipment in good shape:
1 Northwest dragline. 1928. Model No. 4.
1 Page dragline bucket, 1 CY type "C."
1 ¾ yard Owen clamshell bucket.
1 CIO Buckeye Ditcher with boom extension and spare parts.
1 Chicago air compressor.
Ray E. Leininger, Administrator,
Estate of G. E. Leininger,
2210 N. Anthony
Fort Wayne 3, Indiana

New 40 ft. clamshell boom for Bucyrus-Erie No. 1030 machine. Complete with double point sheaves and suspension cable sheaves. Price, $660, F.O.B. Tennessee. Box 3175

1 Bucyrus-Erie ¾-yd. Dozer-Shovel attachment for TD9 Int'l. Harvester tractor, new.
1 skid mounted Skagit winch, double drum, 146,000 lbs., No. 4 speed low gear bare drum, model BU-410-YD, 2 niggerheads, new.
1 centrifugal Allis-Chalmers water pump, type SSDHB, model MBK, 2" suction, 1½" discharge, Wisconsin 1-cylinder air-cooled engine, new.
1 2-yd. Johnson clamshell bucket, new.
1 1½-yd. Blaw-Knox clamshell bucket, new.
1 ¾-yd Pettibone-Mulliken 6E clamshell, new.
1 ¾-yd. Link Belt medium dragline, new.
1 LeTourneau 5-teeth rooter, 6′, used.
1 Mixer, rotary tiller, Seaman model MHD-72, heavy duty, 2 tires trailer hitch, Waukesha engine. Cutting 75" width, with drive from engine through twin disc clutch, front end control, new.
To be seen at 393 Brookline Street
Newton Center 59, Mass.
R. E. Cunniff, Lasell 4300

Surplus Swivel Hook Double Sheave Blocks
2 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheave bushed with self lubricating bronze bushings, grooved for ⅝" rope. Groove diameter 12¼" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 234 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.
1 10 ton "American" 14" swivel hook double sheave block, diamond pattern with cast steel sheaves bushed with self-lubricating bronze bushings. Grooved for ¾" rope. Groove diameter 10½" equipped with 100 lb. cheek weights. 2½" swivel hook. Approximate shipping weight 235 lbs. American Hoist & Derrick Co. Dwg. 1-M-6560.
2 40 ton "American" 24" swivel hook double sheave block diamond pattern with cast steel sheaves grooved for ⅞" rope. Sheaves to be bushed with plain bronze bushings, with center bored sheave pin and ¼" Alemite hydr. grease fitting No. 1980 equipped with 300 lb. cheek weights and 5½" swivel hook. Total weight of block 1100 lbs. Dwg. BEFP 1-M-6560.
BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

International T-40 bulldozer. Box 3179

4 — 9.00 x 20-10 ply rubber tires complete with wheels for type 36-L Bucyrus-Erie spudder. Tires are in perfect condition having been used to haul spudder a distance of one-half mile from railroad cars to drilling site. Price $350 f.o.b. shipping point in Northern Ohio. Terms — Cash in advance of shipment.
Box 3174

Liquidation Sale at Falling Spring, Va.
(Located near Covington, Va.)
1—8 ton PLYMOUTH LOCOMOTIVE MODEL D.L.L. with Climax gasoline motor 42" gauge.
14—EASTON & ATLAS ROCKER DUMP CARS, 78 cable feet capacity 42" gauge.
3—KOPPEL DUMP CARS 4 yd. capacity with brakes 42" gauge.
1—OSGOOD STEAM SHOVEL, 1 yd. bucket Model 29 on caterpillar tractor.
1—BONNOT HAMMERMILL 30" x 36" Serial No. 40 belt driven by 75 H.P., G.E. slipring motor 3 ph 60 cycle 220 V 360 R.P.M. 186 Hmp Type I.
1—JEFFREY PULVERIZER 36"x24" Type 3 Serial 1899, Belt Driven by 100 H.P. Westinghouse slipring motor 3 ph 60 cycle 2200 V 700 R.P.M.
1—GYRATORY CRUSHER AUSTIN MFG. Co. No. 7½ shop No. 3093 driven by 75 H.P., G.E. slipring motor 3 ph 60 cycle 2200V 800 RPM.
1—ROTARY KILN 8′ x 75′.
1—LINK BELT continuous single strand bucket elevator No. 730 chain, buckets —12" x 10", steel support 55′ between centers.
1—LINK BELT continuous single strand bucket elevator bucket 12" x 10" about 75′ between centers.
1—18" BELT CONVEYOR about 100′ between centers.
1—WESTINGHOUSE A. C. GENERATOR 500 K.V.A. 2400 V 120, 5 Amps per terminal 3 ph 60 cycle 600 R.P.M. Serial No. 1231045.
Driven by a Pelton waterwheel with type P Pelton connected to Westinghouse DC generator (exciter) No. 80 L Type S.K. 13.5 KW 135 V 100 Amps 1050 R.P.M.
1—WESTINGHOUSE D.C. generator (convertor) N-750 Type S.K. 60 K.W. 550 V 91 Amps 1140 R.P.M. Serial No. 1321161 Driven by Westinghouse induction motor 75 H.P. 2200 V 19.08 Amps 3 ph 60 cycle 1140 R.P.M. Serial No. 1321045.
Hugo Neu, 31 Nassau St., New York 5, N. Y.
Phone Rector 2-1334

B-Erie 1¼-yd. gas-air shovel, GA-3 reblt.
Marion 4-yd. electric shovel, Model 125.
Monignan electric walking dragline, 3-yd.
Bucyrus-Erie 52B diesel dragline-shovel.
Porter, Vulcan 18-ton stm. loc., 36", reblt.
Whitcomb 8-ton gas locos., 24" ga., (4).
Steam locos., 27 to 50 tons, std. & 42" ga.
Cedar Rapids travel type asphalt plant.
Allis-Chalmers 12K — 27" gyratory crusher.
A-C Superior 54" x 24" crushing rolls.
Euclid 6-yd. bot. dump crawler wagons (8).
25-yd. diesel truck-trailers, bot. dump (7).
Gold placer dredge, 7½′, elec., wood, 28′.
B-Erie 52B 2¼-yd. shovel front attachment.
B-Erie 1¼-yd. shov. dipper; 40′ crane boom.
H. Y. SMITH CO.,
828 B'way., Milwaukee 2, Wisconsin

24 x 24 coal crusher. Box 3178

6 No. 65 Caterpillar tractors, new tracks.
6 Athey 3 way dump wagons.
1 International high lift.
1 Caterpillar elevating grader.
4 1½"-5 K. W. lighting plants.
3 G.M.C. water tank trucks.
6 10 ton tandem 6 wheel trucks.
Surplus new parts for tractors and wagons.
All equipment in working condition.
Box 3182

New 6" sand pump with cutterhead. Box 3177

Main and boom engines, drum complete, and many gear wheels, sheaves and other useful parts from Bucyrus-Erie 70 steam shovel Serial 981. Cheap to anyone who may have use for any such parts. N. D. Connelly, 7321 South Shore Drive, Chicago, Illinois.

2 — Single rope crowd type shovel front ends for Bucyrus-Erie 10-B machines. Good condition. Box 3176

Rope crowd shovel attachment for Bucyrus-Erie 1020 machine. Boom 20′, dipper handle 13′, ½-yd. plate front dipper. Priced for immediate sale. Box 3164

One 2 cubic yard heavy duty rock bucket for 50-B steam shovel. Used 2 weeks. Price $250. Located St. Paul, Minn. Box 3162

One 45 ft. boom practically new, for Marion Model 125 shovel. Box 3161

Six booster clutch springs for Bucyrus-Erie 16-B.
Rhoades Construction Co., Newton, Kansas.

Surplus Hydraulic Press Stock Available
For Immediate Shipment.
4 Beco Portable Hydraulic Presses — 100 tons capacity consisting of: Press cylinder (ram), 4 speed pump with high pressure globe valve, 5′ 0" high pressure hose, 5′ 0" oil return hose.
3 100 ton Press Frames, including:
1 Frame head
1 Cylinder back plate
4 Alloy steel back plate rods, 1" x 20" with 8 nuts
1 Frame base with tie rods and nuts
4 Alloy steel frame rods 1" x 48" with nuts
2 Extension sets, consisting of:
4 Sprocket lugs
4 Rod connectors
4 Extension rods, 24" with nuts
4 Extension rods, 38" with nuts
4 Extension rods 48" alloy steel, with nuts.
1 Frame for track repair work consisting of:
1 Special back plate
3 Rods with nuts to attach press cylinder to track press frame
2 pcs. 10′ 0" High pressure hose with fittings for 100 ton Press.
9 Pressure gauges
Bucyrus-Erie Company
South Milwaukee, Wisconsin

(For Sale Continued on page 592)

For Sale

(Continued from page 591)

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—⅜ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1¼ cu. yd. Drag Shovel Dipper—38-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper 42-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2½ cu. yd. Inserted Type—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper 100-B.
F.O.B. Works

Write for any further information desired

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

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☐ Marine, $4
☐ Machinist, $4
☐ Shipfitter, $1
☐ Radio, $4
☐ Diesel, $2
☐ Mathematics, $2
☐ Sheet Metal, $1
☐ Blueprint, $2
☐ Electricity, $4
☐ Welders, $1
☐ Plumbers, $6
☐ Carpenters, $6
☐ Auto, $4
☐ Refrigeration, $4

If satisfied you pay only $1 a month until purchase price is paid.

AUDEL, Pub., 49 W. 23rd St., N. Y. 10, N. Y.

EQUIPMENT WANTED

One (1) new D-7 Caterpillar tractor equipped with Angledozer and LeTourneau cable control. C. Martinique, General Delivery, Chicago Heights, Illinois.

Notes from the manufacturers

Barco Manufacturing Company, Chicago, has appointed new sales representatives for the distribution of the company's gasoline hammers. D. W. Jacquays, Phoenix, Ariz., has been named distributor for the state of Arizona with the exception of Mohave and Yuma counties. This will provide sales and service facilities at Phoenix and supplement the activities of the Francis Wagner Company of El Paso, Texas, which extends into Arizona.

J. S. Brown, president of the Brown Machinery Company, Oklahoma City, will be sales agent for Oklahoma and H. W. Fletcher, Fletcher Equipment & Supplies, New Orleans, will serve in the same capacity for the territory of southern Louisiana and southern Mississippi. A. B. Pinson and W. S. Winters have been appointed sales representatives in the South Atlantic and Northeastern Atlantic states respectively.

Service Equipment Co., Shreveport, La., distributors for Bucyrus-Erie excavating equipment, T. L. Smith Concrete Mixers, and Hercules Road Rollers, announce the new location of office and shop at 2705 Mansfield Road, Shreveport, La. The company is a partnership composed of Allan S. Minter and George L. L. Smith. The latter was formerly associated with Crook Company, Los Angeles, Calif., and during the war held the rank of major in the U.S. Engineers.

Lovejoy Flexible Coupling Co., 5001-5009 W. Lake St., Chicago 44, has acquired in entirety, the manufacture and sales of the mechanical power transmission department of Ideal Industries of Sycamore, Illinois. Products passing to Lovejoy are: Ideal variable speed pulleys, adjustable motor bases, "Select-O-Speed" transmissions, Ideal drive sheaves, and stock of wide V-belts.

Allegheny Ludlum Steel Corporation, Brackenridge, Pa., has named George Bottcher as Construction Engineer for the company. Bottcher has been with the company since 1940 when he joined their engineering staff after previously working with the Bureau of Yards & Docks, Navy Department, and with the Construction Division of the War Department.

United States Bureau of Reclamation, Washington, D. C., has released information that James L. Morse, mechanical engineer in the Bureau of Reclamation Branch of Design and Construction at Denver, died in May, following an emergency operation.

Barber-Greene Co., Aurora, Ill., manufacturer of asphalt mixing and paving equipment and material handling machines, have appointed new distributors in Texas and Louisiana and their representation in the Southwest now consists of the following: Texas—Overton & Ross, Dallas; Cochran Equipment Co., Houston; Engineered Sales, San Antonio; Fred Berryhill Equipment Co., Lubbock; Contractors Equipment & Supply Co., El Paso. New Mexico—Contractors Equipment & Supply Co., Albuquerque. Colorado—Ray Corson Machinery Co., Denver. Louisiana—Southern Equipment & Tractor Co., Monroe and Baton Rouge. Kansas, Oklahoma, and Western Missouri—Paul L. Matchette Co., Kansas City, Mo.

Hyster Co., Portland Ore., announces that the new Hyster plant in Danville, Ill., is now operating under a production schedule on lift trucks. Both the 2,000 and 4,000-lb. cap. truck models will be manufactured in Danville and are expected to be in full production by fall.

Operating personnel of the new Danville plant include Jay Misenhimer, factory manager; Jim Woodley, assistant factory manager; William Morrow, purchasing agent; and Ray Smith, office manager.

Caterpillar Tractor Co., Peoria, Ill., has named Robert F. Hagerty district representative according to announcement by J. J. Valentine, central division sales manager. Hagerty will serve three distributors: Patten Tractor & Equipment Co., Chicago; Nagle-Hart Tractor & Equipment Co., Madison, Wis., and Brebner Machinery Co., Inc., Green Bay, Wis. He will also have jurisdiction over all agricultural dealers in the territories of these distributors.

Hagerty's new territory was formerly that of E. W. Cunningham who will now serve Peoria Tractor & Equipment Co., Peoria, Ill.; Martin-Rosa Tractor & Equipment Co., Cedar Rapids, Iowa, and Central Illinois Tractor & Equipment Co., Springfield, Ill. W. E. Leming will serve John Fabick Tractor Co., St. Louis; Hobson & Co., Kansas City, and E. A. Martin Machinery Co., Joplin, Mo.

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A MOUTHFUL at EVERY BITE

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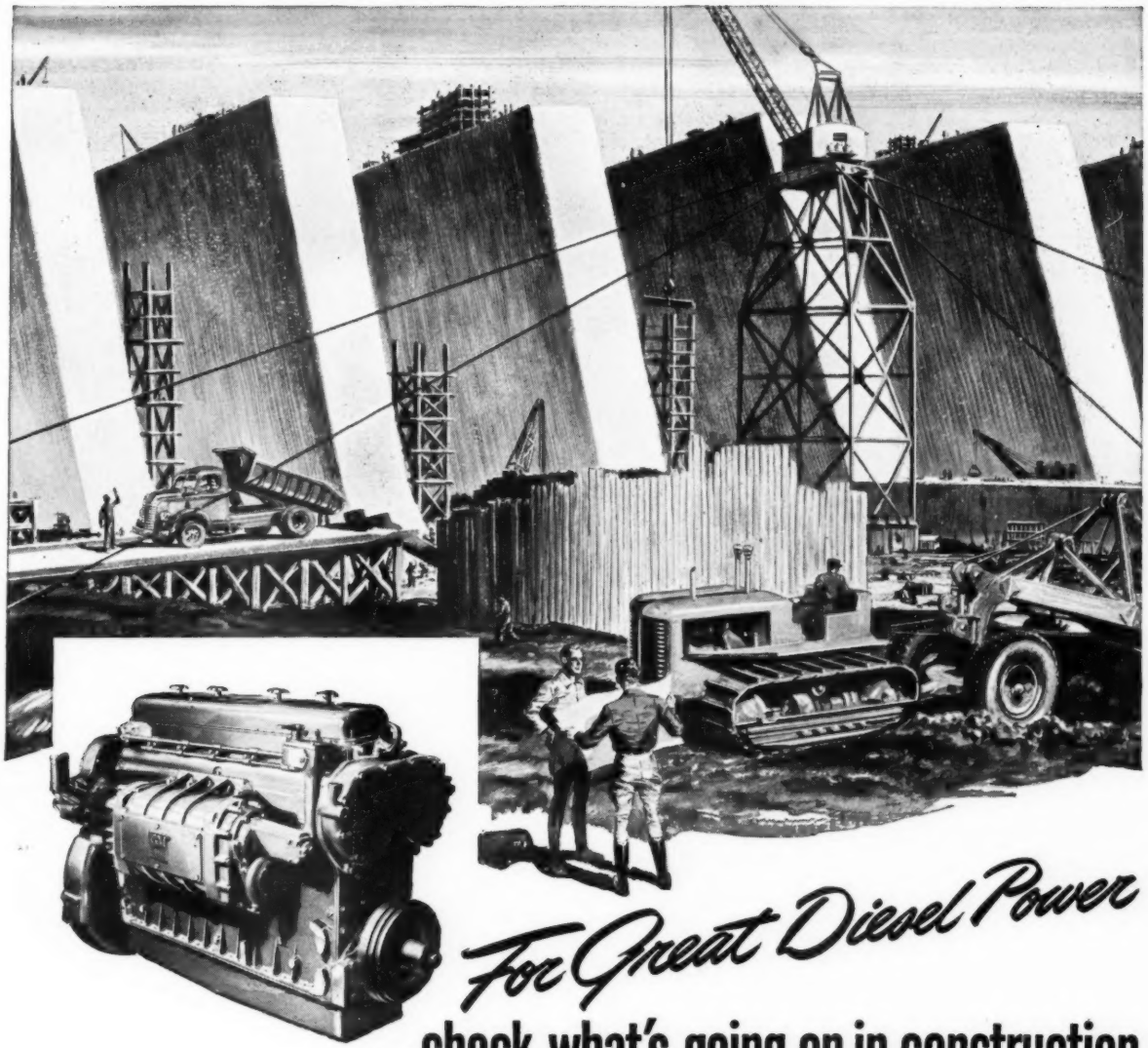

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MODERN construction projects grow on volumes of power. It has to be dependable, hard-hitting, low-cost power.

And what do you find providing that kind of power throughout the industry? General Motors series 71 Diesel engines. You find them in trucks and tractors, in welders and trenchers, in earth movers, graders, compressors, pumps and what-not.

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These are qualities that bring Diesel power advantages to operators who couldn't consider it before.

So whatever needs for power you may have in road-making machinery, crushers, shovels or any other construction equipment—look to GM Diesels.

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- *COMPACT*—readily adaptable to any installation
- *SMOOTH OPERATION*—rotating and reciprocating forces completely balanced
- *QUICK ACCELERATION*—2-cycle principle produces power with every downward piston stroke

PAGE FROM A BLASTER'S NOTEBOOK

USE PRIMACORD TO SPEED UP OPERATIONS ALL ALONG THE LINE

Interested in cutting the time spent in loading, hooking-up, checking? Then Primacord's your answer. For Primacord lets you plan on shooting more holes with more effectiveness at one shot. It reduces *Loading Time* — you simply lace and lower the bottom cartridge, complete the load, stem and tamp; also *Hooking-up Time* — connections are made with easily tied square knots and half-hitches; also *Checking Time* — trunk and branch-line hook-ups are always in plain sight, easily examined.

What's more, Primacord means less hazard on the job. It is not sensitive to stray currents — it requires no cap in the hole, needs only one cap at the end of the main line — attached when all is ready for the shot.

P-23

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